

The Bureau of Land Management's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

The mission of the USDA Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations.

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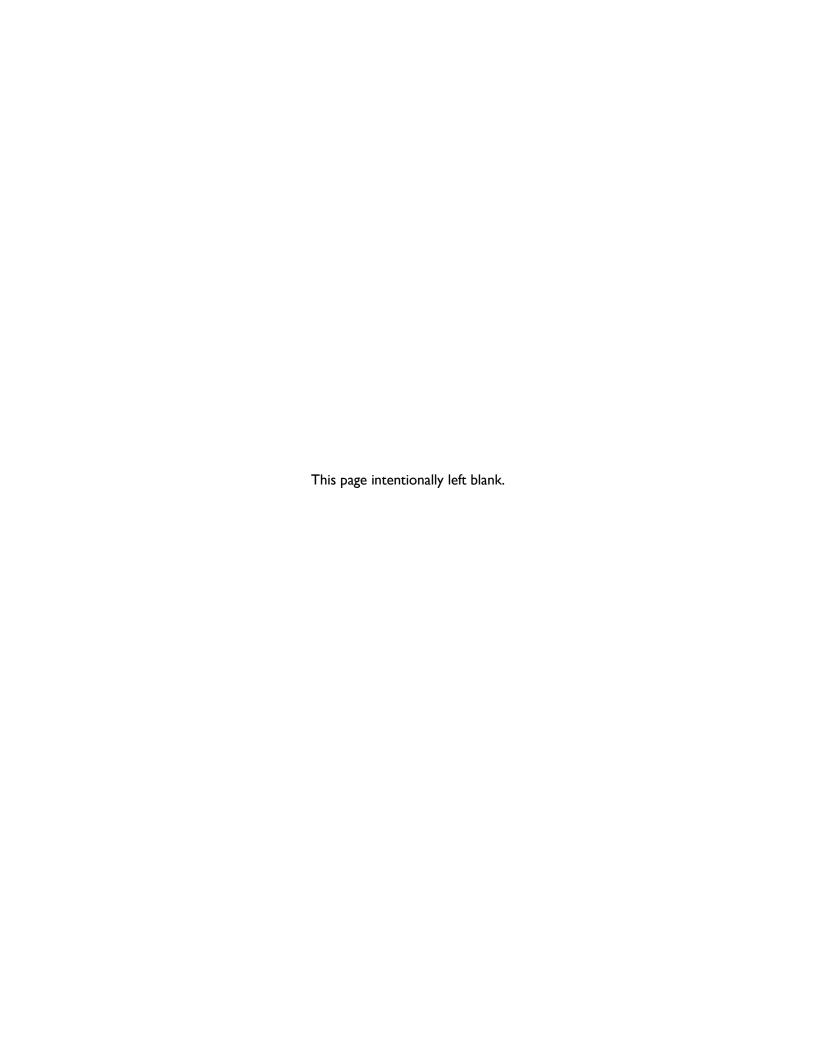
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Appendix B

Applying Lek Buffer-Distances When Approving Actions

APPENDIX B APPLYING LEK BUFFER-DISTANCES WHEN APPROVING ACTIONS

APPLYING LEK BUFFER-DISTANCES WHEN APPROVING ACTIONS

Buffer Distances and Evaluation of Impacts to Leks

Evaluate impacts to leks from actions requiring NEPA analysis. In addition to any other relevant information determined to be appropriate (e.g. State wildlife agency plans), the BLM will assess and address impacts from the following activities using the lek buffer-distances as identified in the USGS Report Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review (Open File Report 2014-1239). The BLM will apply the lek buffer-distances specified as the lower end of the interpreted range in the report unless justifiable departures are determined to be appropriate (see below). The lower end of the interpreted range of the lek buffer-distances is as follows:

- linear features (roads) within 3.1 miles of leks
- infrastructure related to energy development within 3.1 miles of leks
- tall structures (e.g., communication or transmission towers, transmission lines) within 2 miles of leks.
- low structures (e.g., fences, rangeland structures) within 1.2 miles of leks.
- surface disturbance (continuing human activities that alter or remove the natural vegetation) within 3.1 miles of leks.
- noise and related disruptive activities including those that do not result in habitat loss (e.g., motorized recreational events) at least 0.25 miles from leks.

Justifiable departures to decrease or increase from these distances, based on local data, best available science, landscape features, and other existing protections (e.g., land use allocations, state regulations) may be appropriate for determining activity impacts. The USGS report recognized "that because of variation in populations, habitats, development patterns, social context, and other factors, for a particular disturbance type, there is no single distance that is an appropriate buffer for all populations and habitats across the sage-grouse range". The USGS report also states that "various protection measures have been developed and implemented... [which have] the ability (alone or in concert with others) to protect important habitats, sustain populations, and support multiple-use demands for public lands". All variations in lek buffer-distances will require appropriate analysis and disclosure as part of activity authorization.

In determining lek locations, the BLM will use the most recent active or occupied lek data available from the state wildlife agency.

For Actions in GHMA

The BLM will apply the lek buffer-distances identified above as required conservation measures to fully address the impacts to leks as identified in the NEPA analysis. Impacts should first be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.

The BLM may approve actions in GHMA that are within the applicable lek buffer distance identified above only if:

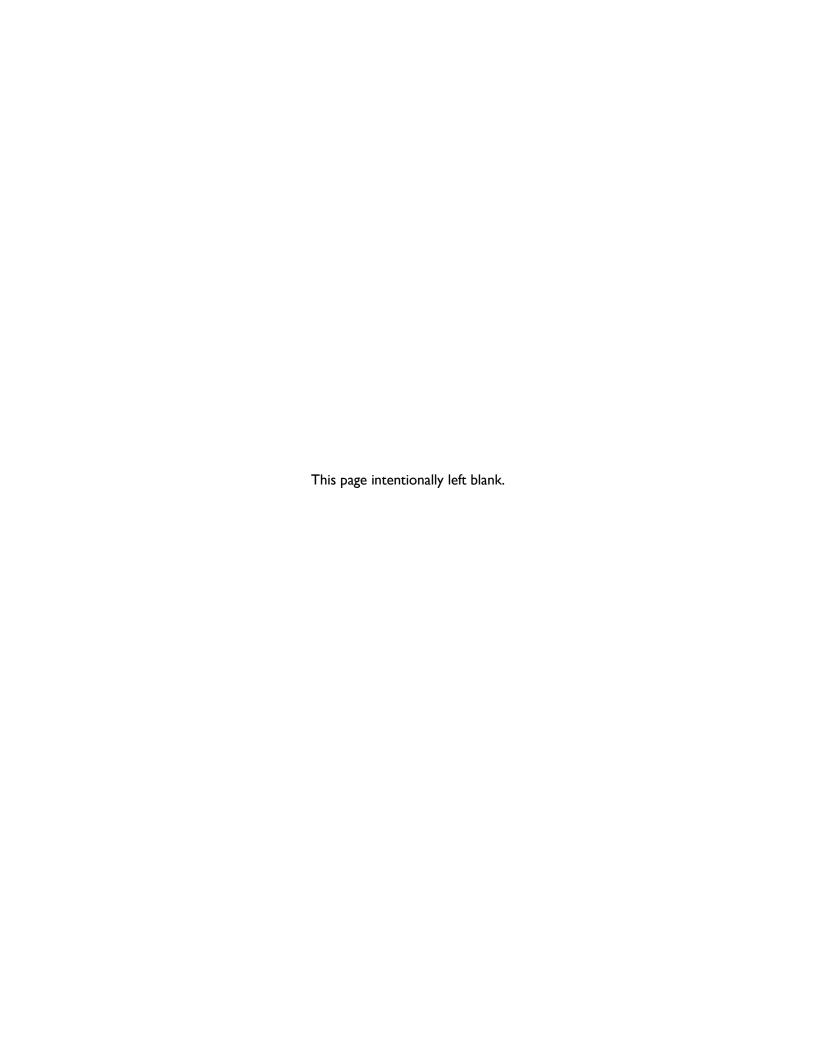
- Based on best available science, landscape features, and other existing protections, (e.g., land use allocations, state regulations), the BLM determines that a lek buffer-distance other than the applicable distance identified above offers the same or a greater level of protection to GRSG and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area; or
- The BLM determines that impacts to GRSG and its habitat are minimized such that the project will cause minor or no new disturbance (ex. co-location with existing authorizations); and
- Any residual impacts within the lek buffer-distances are addressed through compensatory mitigation measures sufficient to ensure a net conservation gain, as outlined in the Mitigation Strategy (Appendix E).

For Actions in PHMA

The BLM will apply the lek buffer-distances identified above as required conservation measures to fully address the impacts to leks as identified in the NEPA analysis. Impacts should be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.

The BLM may approve actions in PHMA that are within the applicable lek buffer distance identified above only if:

- The BLM, with input from the state fish and wildlife agency, determines, based on best available science, landscape features, and other existing protections, that a buffer distance other than the distance identified above offers the same or greater level of protection to GRSG and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area.
 - Range improvements which do not impact GRSG, or, range improvements which provide a conservation benefit to GRSG such as fences for protecting important seasonal habitats, meet the lek buffer requirement.
 - The BLM will explain its justification for determining the approved buffer distances meet these conditions in its project decision.



Appendix D

Required Design Features

APPENDIX D REQUIRED DESIGN FEATURES

Required Design Features (RDFs) are required for certain activities in all GRSG habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the sitespecific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable;
- An alternative RDF is determined to provide equal or better protection for GRSG or its habitat;
- A specific RDF will provide no additional protection to GRSG or its habitat.

PROPOSED PLAN

General RDFs

The following RDFs would apply to development in all programs within PHMA, GHMA and OHMA consistent with applicable law.

RDF Gen I: Locate new roads outside of GRSG habitat to the extent practical.

RDF Gen 2: Avoid constructing roads within riparian areas and ephemeral drainages. Construct low-water crossings at right angles to ephemeral drainages and stream crossings (note that such construction may require permitting under Sections 401 and 404 of the Clean Water Act).

RDF Gen 3: Limit construction of new roads where roads are already in existence and could be used or upgraded to meet the needs of the project or operation. Design roads to an appropriate standard, no higher than necessary, to accommodate intended purpose and level of use.

RDF Gen 4: Coordinate road construction and use with ROW holders to minimize disturbance to the extent possible.

RDF Gen 5: During project construction and operation, establish and post speed limits in GRSG habitat to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.

RDF Gen 6: Newly constructed project roads that access valid existing rights would not be managed as public access roads. Proponents will restrict access by employing traffic control devices such as signage, gates, and fencing.

RDF Gen 7: Require dust abatement practices when authorizing use on roads.

RDF Gen 9: Upon project completion, reclaim roads developed for project access on public lands unless, based on site-specific analysis, the route provides specific benefits for public access and does not contribute to resource conflicts.

RDF Gen 10: Design or site permanent structures that create movement (e.g., pump jack/ windmill) to minimize impacts on GRSG habitat.

RDF Gen II: Equip temporary and permanent aboveground facilities with structures or devices that discourage nesting and perching of raptors, corvids, and other predators.

RDF Gen 12: Control the spread and effects of nonnative, invasive plant species (e.g., by washing vehicles and equipment, minimize unnecessary surface disturbance; Evangelista et al. 2011). All projects would be required to have a noxious weed management plan in place prior to construction and operations.

RDF Gen 13: Implement project site-cleaning practices to preclude the accumulation of debris, solid waste, putrescible wastes, and other potential anthropogenic subsidies for predators of GRSG.

RDF Gen 14: Locate project related temporary housing sites outside of GRSG habitat.

RDF Gen 15: When interim reclamation is required, irrigate site to establish seedlings more quickly if the site requires it.

RDF Gen 16: Utilize mulching techniques to expedite reclamation and to protect soils if the site requires it.

RDF Gen 17: Restore disturbed areas at final reclamation to the predisturbance landforms and desired plant community.

RDF GEN 18: When authorizing ground-disturbing activities, require the use of vegetation and soil reclamation standards suitable for the site type prior to construction.

RDF GEN 19: Instruct all construction employees to avoid harassment and disturbance of wildlife, especially during the GRSG breeding (e.g., courtship and nesting) season. In addition, pets shall not be permitted on site during construction (BLM 2005b).

RDF GEN 20: To reduce predator perching in GRSG habitat, limit the construction of vertical facilities and fences to the minimum number and amount needed and install anti-perch devices where applicable.

RDF GEN 21: Outfit all reservoirs, pits, tanks, troughs or similar features with appropriate type and number of wildlife escape ramps (BLM 1990; Taylor and Tuttle 2007).

RDF GEN 22: Load and unload all equipment on existing roads to minimize disturbance to vegetation and soil.

In addition to the General RDFs, the following resource programs will include the following program specific RDFs applicable to PHMA, GHMA and OHMA consistent with applicable law:

Lands and Realty*

RDF LR-LUA I: Where new ROWs associated with valid existing rights are required, co-locate new ROWs within existing ROWs or where it best minimizes impacts in GRSG habitat. Use existing roads or realignments of existing roads to access valid existing rights that are not yet developed.

RDF LR-LUA 2: Do not issue ROWs to counties on newly constructed energy/mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.

RDF GEN 3: Where necessary, fit transmission towers with anti-perch devices (Lammers and Collopy 2007) in GRSG habitat.

*These RDFs also apply to other land use authorizations such as leases and permits.

Fuels and Fire Management

RDF WFM I: Power-wash all firefighting vehicles, including engines, water tenders, personnel vehicles, and all-terrain vehicles (ATVs), prior to deploying in or near GRSG habitat to minimize the introduction and spread of undesirable and invasive plant species.

RDF WFM 2: Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.

RDF WFM 3: Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.

Fluid Minerals RDFs

RDF Lease FM 1: Co-locate power lines, flow lines, and small pipelines under or immediately adjacent to existing roads (Bui et al. 2010) in order to minimize or avoid disturbance.

RDF Lease FM 2: Cover, create barriers, or implement other effective deterrents (e.g., netting, fencing, birdballs, and sound cannons) for all ponds and tanks containing potentially toxic materials to reduce GRSG mortality.

RDF Lease FM 3: Require installation of noise shields to comply with noise restrictions (see Action SSS 7) when drilling during the breeding, nesting, brood-rearing, and/or wintering season. Require applicable GRSG seasonal timing restrictions when noise restrictions cannot be met (see Action SSS 6).

RDF Lease FM 4: Ensure habitat restoration meets GRSG habitat objectives (Table 2-3) for reclamation and restoration practices/sites (Pyke 2011).

RDF Lease FM 5: Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoil management, and revegetating cut-and-fill slopes.

RDF Lease FM 6: Restore disturbed areas at final reclamation to the predisturbance landforms and meets the GRSG habitat objectives (table 2-3).

RDF Lease FM 7: Use only closed-loop systems for drilling operations and no reserve pits within GRSG habitat.

RDF Lease FM 8: Place liquid gathering facilities outside of GRSG habitat. Have no tanks at well locations within GRSG habitat to minimize vehicle traffic and perching and nesting sites for aerial predators of GRSG.

RDF Lease FM 9: In GRSG habitat, use remote monitoring techniques for production facilities and develop a plan to reduce vehicular traffic frequency of vehicle use (Lyon and Anderson 2003).

RDF Lease FM 10: Use dust abatement practices on well pads.

RDF Lease FM II: Cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement.

RDF Lease FM 12: Apply a phased development approach with concurrent reclamation.

RDF Lease FM 13: Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Dougherty 2007).

RDF Lease FM 14: In GRSG habitat, remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat (Doherty 2007):

- Overbuild size of ponds for muddy and non-vegetated shorelines
- Build steep shorelines to decrease vegetation and increase wave actions
- Avoid flooding terrestrial vegetation in flat terrain or low lying areas
- Construct dams or impoundments that restrict down slope seepage or overflow
- Line the channel where discharge water flows into the pond with crushed rock
- Construct spillway with steep sides and line it with crushed rock.
- Treat waters with larvicides to reduce mosquito production where water occurs on the surface

RDF Lease FM 15: Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.

Locatable Minerals

RDF LOC I: Install noise shields to comply with noise restrictions (see Action SSS 7) when drilling during the breeding, nesting, brood-rearing, and/or wintering season. Apply GRSG seasonal timing restrictions when noise restrictions cannot be met (see Action SSS 6).

RDF LOC 2: Cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement.

RDF LOC 3: Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Dougherty 2007).

RDF LOC 4: Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat (Doherty 2007):

- Overbuild size of ponds for muddy and non-vegetated shorelines
- Build steep shorelines to decrease vegetation and increase wave actions
- Avoid flooding terrestrial vegetation in flat terrain or low lying areas
- Construct dams or impoundments that restrict down slope seepage or overflow
- Line the channel where discharge water flows into the pond with crushed rock
- Construct spillway with steep sides and line it with crushed rock.
- Treat waters with larvicides to reduce mosquito production where water occurs on the surface

RDF LOC 5: Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.

RDF LOC 6: Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.

RDF LOC 7: Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.

Comprehensive Travel and Transportation Management

RDF CTTM 1: Rehabilitate roads, primitive roads, and trails not designated in approved travel management plans.

RDF CTTM 2: Reclaim closed duplicate roads by restoring original landform and establishing desired vegetation in GRSG habitat in accordance with

GRSG habitat objectives (Table 2-3) as identified in travel management planning.

ALTERNATIVE A

No Required Design Features (RDFs) were identified under Alternative A.

ALTERNATIVE B

Alternative B contains best management practices (BMPs) from the NTT report that were brought forward as RDFs consistent with applicable law.

Fluid Minerals RDFs

Roads - PHMA

- Close and rehabilitate duplicate roads.
- Use dust abatement on roads and pads.
- Restrict vehicle traffic to only authorized users on newly constructed routes (using signage, gates, etc.).
- Do not issue ROWs or SUAs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Establish trip restrictions (Lyon and Anderson 2003) or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Establish speed limits on BLM and National Forest System roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Construct road crossings at right angles to ephemeral drainages and stream crossings.
- Coordinate road construction and use among ROW or SUA holders.
- Locate roads to avoid important areas and habitats.
- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been fully restored.
- Apply a phased development approach with concurrent reclamation.

- Place liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority habitat areas to minimize truck traffic and perching and nesting sites for ravens and raptors.
- Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).
- Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use (Lyon and Anderson 2003).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs or SUAs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury distribution power lines.
- Co-locate power lines, flow lines, and small pipelines under or immediately adjacent to existing roads (Bui et al. 2010).
- Design or site permanent structures which create movement (e.g., pump jack) to minimize impacts to GRSG.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce GRSG mortality.
- Equip tanks and other above-ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Evangelista et al. 2011) (e.g., by washing vehicles and equipment.).
- Use only closed-loop systems for drilling operations and no reserve pits.
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
 - Overbuild size of ponds for muddy and non-vegetated shorelines.
 - Build steep shorelines to decrease vegetation and increase wave actions.

- Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
- Construct dams or impoundments that restrict down slope seepage or overflow.
- Line the channel where discharge water flows into the pond with crushed rock.
- Construct spillway with steep sides and line it with crushed rock.
- Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. In preparation).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Require GRSG-safe fences.
- Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.
- Clean up refuse (Bui et al. 2011).
- Locate man camps outside of priority habitats.

Reclamation - PHMA

- Include objectives for ensuring habitat restoration to meet GRSG
 habitat needs in reclamation practices/sites (Pyke 2011). Address
 post reclamation management in reclamation plan such that goals
 and objectives are to protect and improve GRSG habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoiling and revegetating cutand-fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

Roads - GHMA

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Do not issue ROWs or SUAs to counties on energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Establish speed limits to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Coordinate road construction and use among ROW or SUA holders.
- Construct road crossings at right angles to ephemeral drainages and stream crossings.
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads by restoring original landform and establishing desired vegetation.

Operations - GHMA

- Cluster disturbances, operations (fracturing stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Clean up refuse (Bui et al. 2010).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce GRSG mortality.
- Equip tanks and other above-ground facilities with structures or devices that discourage nesting by raptors or corvids.
- Use remote monitoring techniques for production facilities and develop a plan to reduce vehicular traffic frequency of vehicle use.
- Control the spread and effects from non-native plant species. (e.g., by washing vehicles and equipment).
- Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Dougherty 2007). See this table's BMP Section A: West Nile Virus.

Locatable Minerals RDFs

Roads - PHMA

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purposes.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW or SUA holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM and National Forest System roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs or SUAs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions including this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (e. g., use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations - PHMA

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs or SUAs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all
 pits and tanks regardless of size to reduce GRSG mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.

- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007). See this table's BMP Section A: West Nile Virus.
- Require GRSG-safe fences around sumps.
- Clean up refuse (Bui et al. 2010).
- Locate man camps outside of priority GRSG habitats.

Reclamation – PHMA

- Include restoration objectives to meet GRSG habitat needs in reclamation practices/sites.
- Address post reclamation management in reclamation plans such that goals and objectives are to protect and improve GRSG habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
- Irrigate interim reclamation as necessary during dry periods. Utilize mulching techniques to expedite reclamation.

Fuels and Fire Management RDFs

Fuels Management

- Where applicable, design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patters which most benefit GRSG habitat.
- Provide training to fuels treatment personnel on GRSG biology, habitat requirements, and identification of areas utilized locally.
- Use fire prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of hydrophobicity).
- Ensure proposed sagebrush treatments are planned with interdisciplinary input from BLM, Forest Service, and /or state wildlife agency biologist and that treatment acreage is conservative in the context of surrounding GRSG seasonal habitats and landscape.

- Where appropriate, ensure that treatments are configured in a manner (e.g., strips) that promotes use by GRSG (See Connelly et al. 2000).
- Where applicable, incorporate roads and natural fuel breaks into fuel break design.
- Power-wash all vehicles and equipment involved in fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.
- Design vegetation treatment in areas of high frequency to facilitate firefighting safety, reduce the risk of extreme fire behavior; and to reduce the risk and rate of fire spread to key and restoration habitats.
- Give priority for implementing specific GRSG habitat restoration projects in annual grasslands first to sites which are adjacent to or surrounded by GRSG key habitats. Annual grasslands are second priority for restoration when the sites not adjacent to key habitat, but within 2 miles of key habitat. The third priority for annual grasslands habitat restoration projects are sites beyond 2 miles of key habitat. The intent is to focus restoration outward from existing, intact habitat.
- As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs.
- Emphasize the use of native plant species, recognizing that nonnative species may be necessary depending on the availability of native seed and prevailing site conditions.
- Remove standing and encroaching trees within at least 100 meters
 of occupied GRSG leks and other habitats (e.g., nesting, wintering,
 and brood rearing) to reduce the availability of perch sites for avian
 predators, as appropriate, and resources permit.
- Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
- Reduce the risk of vehicle or human-caused wildfires and the spread
 of invasive species by planting perennial vegetation (e.g., greenstrips) paralleling road rights-of-way.
- Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to ail in controlling wildfire should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).

Fire Management

- Develop state-specific GRSG toolboxes containing maps, a list of resource advisors, contact information, local guidance, and other relevant information.
- Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and determining suppression tactics.
- Assign a GRSG resource advisor to all extended attack fires in or near key GRSG habitat areas. Prior to the fire season, provide training to GRSG resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.
- On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in GRSG habitat areas.
- During periods of multiple fires, ensure line officers are involved in setting priorities.
- To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, and heli-bases) in areas where physical disturbance to GRSG habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
- Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and ATVs prior to deploying in or near GRSG habitat areas to minimize noxious weed spread.
- Minimize unnecessary cross-country vehicle travel during fire operations in GRSG habitat.
- Minimize burnout operations in key GRSG habitat areas by constructing direct fire line whenever safe and practical to do so.
- Utilize retardant and mechanized equipment to minimize burned acreage during initial attack.
- As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.

ALTERNATIVES C, D, AND F

Alternatives C, D, and F contain RDFs based on the NTT report in addition to RDFs developed by the BLM and Forest Service ID Team to be applied consistent with applicable law.

Fluid Minerals RDFs

Roads - PHMA

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW or SUA holders.
- Construct road crossings at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM and National Forest System roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Establish trip restrictions (Lyon and Anderson 2003) or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Do not issue ROWs or SUAs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (using signage, gates, etc.)
- Use dust abatement on roads and pads.
- Close and rehabilitate duplicate roads.
- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been fully restored.
- Apply a phased development approach with concurrent reclamation.
- Place liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority habitat areas to minimize truck traffic and perching and nesting sites for ravens and raptors.
- Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).
- Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use (Lyon and Anderson 2003).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.

- Site and/or minimize linear ROWs or SUAs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury distribution power lines.
- Collocate powerlines, flowlines, and small pipelines under or immediately adjacent to existing roads (Bui et al. 2010).
- Design or site permanent structures which create movement (e.g., pump jack) to minimize impacts to sage-grouse.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce GRSG mortality.
- Equip tanks and other above-ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Evangelista et al. 2011) (e.g., by washing vehicles and equipment).
- Use only closed-loop systems for drilling operations and no reserve pits.
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
 - Overbuild size of ponds for muddy and non-vegetated shorelines.
 - Build steep shorelines to decrease vegetation and increase wave actions.
 - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
 - Construct dams or impoundments that restrict down slope seepage or overflow.
 - Line the channel where discharge water flows into the pond with crushed rock.
 - Construct spillway with steep sides and line it with crushed
 - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.

- Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. In preparation).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Require GRSG-safe fences.
- Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.
- Clean up refuse (Bui et al. 2011).
- Locate man camps outside of priority habitats.

Reclamation - PHMA

- Include objectives for ensuring habitat restoration to meet GRSG
 habitat needs in reclamation practices/sites (Pyke 2011). Address
 post reclamation management in reclamation plan such that goals
 and objectives are to protect and improve GRSG habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoiling and revegetating cutand-fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

Roads - GHMA

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Do not issue ROWs or SUAs to counties on energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Establish speed limits to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Coordinate road construction and use among ROW or SUA holders.
- Construct road crossings at right angles to ephemeral drainages and stream crossings.

- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads by restoring original landform and establishing desired vegetation.

Operations - GHMA

- Cluster disturbances, operations (fracturing stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Clean up refuse (Bui et al. 2010).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce GRSG mortality.
- Equip tanks and other above-ground facilities with structures or devices that discourage nesting by raptors or corvids.
- Use remote monitoring techniques for production facilities and develop a plan to reduce vehicular traffic frequency of vehicle use.
- Control the spread and effects from non-native plant species. (e.g., by washing vehicles and equipment.)
- Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Dougherty 2007).

Locatable Minerals RDFs

Roads - PHMA

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purposes.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW or SUA holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM and National Forest System roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs or SUAs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions including this document.

- Restrict vehicle traffic to only authorized users on newly constructed routes (e. g., use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations - PHMA

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs or SUAs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all
 pits and tanks regardless of size to reduce GRSG mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Require GRSG-safe fences around sumps.
- Clean up refuse (Bui et al. 2010).
- Locate man camps outside of priority GRSG habitats.

Reclamation - PHMA

- Include restoration objectives to meet GRSG habitat needs in reclamation practices/sites.
- Address post reclamation management in reclamation plans such that goals and objectives are to protect and improve GRSG habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.

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- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community
- Irrigate interim reclamation as necessary during dry periods. Utilize mulching techniques to expedite reclamation.

Fuels and Fire Management RDFs

Fuels Management

- Where applicable, design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patters which most benefit GRSG habitat.
- Provide training to fuels treatment personnel on GRSG biology, habitat requirements, and identification of areas utilized locally.
- Use burning prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of annual grass invasion).
- Ensure proposed sagebrush treatments are planned with full interdisciplinary input pursuant to NEPA and coordination with state fish and wildlife agencies, and that treatment acreage is conservative in the context of surrounding GRSG seasonal habitats and landscape.
- Where appropriate, ensure that treatments are configured in a manner that promotes use by GRSG. Where applicable, incorporate roads and natural fuel breaks into fuel break design.
- Power-wash all vehicles and equipment involved in fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.
- Design vegetation treatments in areas of high fire frequency which facilitate firefighter safety, reduce the potential acres burned, and reduce the fire risk to GRSG habitat. Additionally, develop maps for GRSG habitat which spatially display existing fuels treatments that can be used to assist suppression activities. Give priority for implementing specific GRSG habitat restoration projects in annual grasslands, first to sites which are adjacent to or surrounded by PHMA or that reestablish continuity between priority habitats. Annual grasslands are a second priority for restoration when the sites are not adjacent to PHMA, but within two miles of PHMA. The third priority for annual grassland habitat restoration projects are sites beyond two miles of PHMA. The intent is to focus restoration outward from existing, intact habitat.
- As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and

- shrubs or one of that referenced in land use planning documentation.
- Emphasize the use of native plant species, recognizing that nonnative species may be necessary depending on the availability of native seed and prevailing site conditions.
- Remove standing and encroaching trees within at least 110 yards of occupied GRSG leks and other habitats (e.g., nesting, wintering and brood rearing) to reduce the availability of perch sites for avian predators, as resources permit. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
- Reduce the risk of vehicle- or human-caused wildfires and the spread of invasive species by installing fuel breaks and/or planting perennial vegetation (e.g., green-strips) paralleling road rights-ofway. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, etc.) to aid in controlling wildfire, should wildfire occur near PHMA or important restoration areas (such as where investments in restoration have already been made).

Fire Management

- Compile District/Forest level information into state-wide GRSG tool boxes. Tool boxes will contain maps, listing of resource advisors, contact information, local guidance, and other relevant information for each District/Forest, which will be aggregated into a state-wide document.
- Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
- Assign a resource advisor with GRSG expertise, or who has access
 to GRSG expertise, to all extended attack fires in or near GRSG
 habitat. Prior to the fire season, provide training to GRSG resource
 advisors on wildfire suppression organization, objectives, tactics, and
 procedures to develop a cadre of qualified individuals. Involve state
 wildlife agency expertise in fire operations through:
 - instructing resource advisors during preseason trainings;
 - qualification as resource advisors;
 - coordination with resource advisors during fire incidents;
 - contributing to incident planning with information such as habitat features or other key data useful in fire decision making.

- On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in GRSG habitat areas.
- During periods of multiple fires, ensure line officers are involved in setting priorities.
- To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases, etc.) in areas where physical disturbance to GRSG habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles (ATV) prior to deploying in or near GRSG habitat areas to minimize noxious weed spread. Minimize unnecessary cross-country vehicle travel during fire operations in GRSG habitat.
- Minimize burnout operations in key GRSG habitat areas by constructing direct fire line whenever safe and practical to do so.
- Utilize retardant, mechanized equipment, and other available resources to minimize burned acreage during initial attack. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.
- Adequately document fire operation activities in GRSG habitat for potential follow-up coordination activities.

Wildlife/Greater Sage-Grouse RDFs

- During the period specified, manage discretionary surface disturbing activities and uses to prevent disturbance to GRSG during life cycle periods. Seasonal protection is identified for the following: Seasonal Protection within four (4) miles of active GRSG leks from March I through June 15, Seasonal protection of GRSG wintering areas from November I through March 31, Seasonal protection of GRSG wintering areas from November I through March 31, Seasonal protection of GRSG brood-rearing habitat from May 15 to August 15.
- For any surface-disturbing activities proposed in sagebrush shrublands, the Proponent will conduct clearance surveys for GRSG breeding activity during the GRSG's breeding season before initiating the activities. The surveys must encompass all sagebrush shrublands within 3.0 miles of the proposed activities. Three surveys would be conducted every season during pre-planning operations. In areas found to have probable GRSG activity, surveys should continue during project operations.

- Ensure that all authorized ground disturbing projects have vegetation reclamation standards suitable for the site type prior to construction and ensure that reclamation to appropriate GRSG standards are budgeted for.
- Remove or modify existing water developments that are negatively impacting GRSG habitats.
- Build or modify exclosures so that they large enough to provide hiding cover to GRSG and other wildlife and to reduce the possibility of wildlife collisions with fences. This includes mitigation for reduction of Culex mosquitos.
- In PHMA, remove livestock ponds built in perennial channels that are negatively impacting riparian habitat, either directly or indirectly, and do not permit new ones to be built in these areas.
- Ensure that any water developments do not remove more than 50 percent of water from any spring or other surface water source, in accordance with state water law and subject to valid existing rights. Water developments should make water available on the ground for wildlife use. All troughs should be outfitted with the appropriate type and number of wildlife escape ramps.
- On BLM and National Forest System Wilderness and Wilderness Study Areas (WSAs), mechanized equipment may be used to protect areas of high resource concerns or values; however, the use of mechanized equipment will be evaluated against potential longterm resource damage.
- During the period specified, manage discretionary surface disturbing activities and uses to prevent disturbance to GRSG during life cycle periods. Seasonal protection is identified for the following:
 - Seasonal Protection within four (4) miles of active GRSG leks from March I through June 15.
 - Seasonal protection of GRSG wintering areas from November I through March 31.
 - Seasonal protection of GRSG brood-rearing habitat from May 15 to August 15.
- All field and district offices should apply BLM IM 2013-094 or similar methodology until superseded related to drought management planning.
- Use aircraft to check livestock in areas where consistent trespass has been noted and access/manpower is difficult to obtain.
- In pastures where short term livestock utilization standards are not met, AUMs grazed the following year should be reduced accordingly. AUMs cannot be applied to another pasture.

- In PHMA, any pasture scheduled for rest as part of its grazing permit schedule should not be used if short term utilization limits have been exceeded.
- Fire and fuels operations should focus on protecting and enhancing occupied GRSG habitats. This includes taking into account the feasibility and cost of future rehabilitation efforts during WFDSS planning and general fire operations in all occupied GRSG habitats.
- To reduce the probability of Culex mosquitos or reductions in nesting habitat volumes, evaluate the need for livestock reductions or changes in seasons of use before considering construction of new livestock ponds in PHMA.
- Implement appropriate time-of-day and/or time-of year restrictions for future construction and/or maintenance activities in known GRSG habitat to avoid adverse impacts.
- In evaluating land and realty actions, consider off-site mitigation on a case-by-case basis.
- Avoid authorizing rights-of-way that would result in significant habitat loss, habitat fragmentation, or population disturbance.
- Reseed all areas requiring reclamation with a seed mixture appropriate for the soils, climate, and landform of the area to ensure recovery of the ecological processes and habitat features of the potential natural vegetation, and to prevent the invasion of noxious weeds or other exotic invasive species.
- Work with existing rights-of-way holders in an attempt to install perch guards on all poles where existing utility poles are located within 3miles of known leks, where necessary. Stipulate these requirements at grant renewal.
- Authorize new rights-of-way at least 3.3 km (2miles) or other appropriate distances (based on features such as type of project, topography, etc.) from leks.
- Use existing utility corridors and consolidate rights-of-way to reduce habitat loss, degradation, and fragmentation. Whenever possible, install new power lines within existing utility corridors. Otherwise power lines should be located at least 3 miles from breeding, nesting, brood-rearing and winter habitat.
- Where GRSG conservation opportunities exist, BLM field offices and Forests should work in cooperation with righters-of-way holders to conduct maintenance and operation activities, authorized under an approved ROW grant, to avoid and minimize effect on GRSG habitat.

- When renewing or amending ROWs, assess the impacts of ongoing use of the ROW to GRSG habitat and minimize such impacts to the extent allowed by law.
- Work with applicants to minimize habitat loss, fragmentation, and direct and indirect effects to GRSG and its habitat.
- Conduct pre-application meetings for all new ROW proposals consistent with the ROW regulations (43 CFR 2804.10) and consistent with current renewable energy ROW policy guidance (WO-IM-2011-061, issued February, 2011). Assess the impact of the proposed ROW on GRSG and its habitat, and implement the following: Ensure that reasonable alternatives for siting the ROW outside of GRSG habitat or within a BLM designated utility corridor are considered and analyzed in the NEPA document; and identify technically feasible best management practices, conditions, (e.g., siting, burying power lines) that may be implemented in order to eliminate or minimize impacts.
- For ROWs where the total project disturbance for the ROW and any connected action is less than I linear mile, or 2 acres of disturbance, develop mitigation measures related to construction, maintenance, operation, and reclamation activities that as determined in cooperating with the Nevada Department of Wildlife, would cumulatively maintain or enhance GRSG habitat.
- For ROW applications where the total project disturbance from the ROW and any connected action is greater than I linear mile or 2 acres of disturbance, the each District will determine that it is appropriate to authorize a ROW, utilizing the following process:
 - The BLM will document the reasons for its determination and require the ROW holder to implement measures to minimize impacts to sage grouse habitat.
 - In addition to considering opportunities for onsite mitigation, the BLM will, to the extent possible, cooperate with the project proponents to develop and consider implement appropriate offset mitigation that the BLM, coordinating with the Nevada Department of Wildlife determines would avoid or minimize habitat and populationlevel effects (Refer to WO-IM 2012-043 Greater Sage Grouse Interim Management Policies and Procedures.) When developing such mitigation, the BLM should consider compensating for the short-term and long-term direct and indirect loss of GRSG and its habitat.
- Establish speed limits on BLM and National Forest System roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.

- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Authorize ROWs by applying appropriate BMPs (BLM Wind Energy Development EIS, June 2005), land use restrictions, stipulations, and mitigation measures.
- An Environmental Assessment is required for applications for monitoring sites in known Sage-Grouse Population Management Units.

ALTERNATIVE E

Under Alternative E, Required Design features have been brought forward by the State of Nevada as part of their Nevada Greater Sage Grouse Conservation Plan and would only apply to lands in the state of Nevada within the subregion. Site Specific Consultation Based Design Features (here after Design Features) are used to minimize impacts to GRSG and its habitat due to disturbances on a project by project and site by site basis. Design Features in the state of Nevada's plan apply to all newly proposed projects and modifications to existing projects. Existing projects within SGMAs are not currently subject to Design Features; however all Design Features listed below, according to program area, are required to be considered as part of the SETT Consultation process. The state of Nevada recognizes that all Design Features may not be practical, feasible, or appropriate in all instances considering site conditions and project specifications, nor is this list completely exhaustive. Therefore, the SETT in coordination with the project proponent, will consider all of the listed Design Features on a sitespecific basis. If certain Design Features are determined to not be practical, feasible, or appropriate for the specific project site, the SETT will document the reasons the Design Features were not selected. The SETT may also consider additional Design Features that may minimize impacts to GRSG and its habitat that are not specifically listed here and document the reasons for selecting the additional Design Features.

Mineral Resources

Fluid Minerals

Operations

- Cluster disturbances associated with operations and facilities as close as possible, unless site specific conditions indicate that disturbances to sagebrush habitat would be reduced if operations and facilities locations would best fit a unique special arrangement.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations.

- Apply a phased development approach with concurrent reclamation through a coordination process among relevant parties.
- Place liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority habitat areas to minimize truck traffic, and perching and nesting sites for ravens and raptors.
- Pipelines should be under or immediately adjacent to the road.
- Reduce motor vehicle travel during field operations through development and implementation of remote monitoring and control systems plans.
- To reduce predator perching, limit the construction of vertical facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs or SUAs to reduce disturbance to GRSG habitats.
- Co-locate new utility developments (power lines, pipelines, etc.) and transportation routes with existing utility or transportation corridors where adequate spacing separation can be achieved in order to preserve grid reliability and ongoing maintenance capability.
- Bury distribution power lines of up to 35kV where ground disturbance can be minimized. Where technology and economic factors allow, bury higher kV power lines.
- Power lines, flow lines, and small pipelines should be co-located under or immediately adjacent to existing roads.
- Permanent structures, which create movement (e.g., pump jack) should be designed or sited to minimize impacts to GRSG.
- Preclude GRSG access to pits and tanks through use of practical techniques (e.g. covers, netting, birdballs, location, etc.).
- Equip tanks and other above-ground facilities with structures or devices that discourage nesting and/ or perching of raptors, corvids, and other predators.
- Control the spread and effects of non-native, invasive plant species (Evangelista et al. 2011) (e.g., by washing vehicles and equipment, minimize unnecessary surface disturbance). All projects within SGMAs should have a noxious weed management plan in place prior to construction and operations.
- Use only closed-loop systems for drilling operations and no reserve pits.
- Reduce the potential for creating excessive or unintended mosquito habitat and associated risk of West Nile Virus impacts to GRSG.
 This can be implemented through minimizing pit and pond

- construction and, where necessary, size of pits and ponds (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues and West Nile virus has been identified as a concern in the project area, use the following steps for reservoir design to limit favorable mosquito habitat (Doherty 2007):
 - Overbuild size of ponds for muddy and non-vegetated shorelines.
 - Build steep shorelines to decrease vegetation and increase wave actions. Ponds with steep shorelines will be equipped with NDOW approved wildlife escape ramps.
 - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
 - Construct dams or impoundments that restrict down slope seepage or overflow.
 - Line the channel where discharge water flows into the pond with crushed rock.
 - Construct spillway with steep sides and line it with crushed rock.
 - Treat waters with larvicides to reduce mosquito production where water occurs on the surface if necessary.
- Limit noise to less than 10 decibels above ambient measures at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. 2012).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit new transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Design and construct fences consistent with NRCS fence standards and specifications Code 382 and, where appropriate, use fence markers (Sage Grouse Initiative 2013).
- Locate new compressor stations outside priority habitats.
 Otherwise design them to reduce noise that may be directed towards priority habitat.
- Implement site keeping practices to preclude the accumulation of debris, solid waste, putrescible wastes, and other potential anthropogenic subsidies for predators of GRSG (Bui et al 2010).
- Locate man camps outside of priority habitats.

Reclamation

- Include objectives for ensuring habitat rehabilitation to meet GRSG
 habitat needs in reclamation practices/sites (Pyke 2011). Address
 post reclamation management in reclamation plans such that goals
 and objectives are to protect and improve GRSG habitat needs.
- Reseed all areas requiring reclamation with a seed mixture appropriate for the soils, climate, and landform of the area to ensure recovery of the ecological processes and habitat features of the potential natural vegetation, and to prevent the invasion of noxious weeds or other exotic invasive species. Long-term monitoring is required to determine success.
- Maximize the area of interim and concurrent reclamation on longterm access roads and well pads, including reshaping, topsoiling and revegetating cut-and-fill slopes. In coordination with appropriate agencies, consider development of fuel breaks in reclamation design.
- Restore disturbed areas at final reclamation to the near predisturbance landforms and the desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly and if water rights are available.
- Utilize mulching techniques to expedite reclamation and to protect soils.
- Ensure that all authorized ground disturbing projects have vegetation reclamation standards suitable for the site type prior to construction and ensure that reclamation to appropriate GRSG standards are budgeted for in the reclamation bond.

Locatable Minerals

For consistency, GRSG Site Specific Consultation Based Design Features for locatable minerals shall be considered in association with state and federal permitting requirements including bonding, if applicable.

Oberations

- Cluster disturbances associated with operations and facilities as close as possible unless site specific conditions indicate that disturbances to sagebrush habitat would be reduced if operations and facilities locations would best fit a unique special arrangement.
- Minimize site disturbance though site analysis and facility planning.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Apply a phased development approach with concurrent reclamation through a coordination process among relevant parties.

- Reduce motor vehicle travel during field operations through development and implementation of remote monitoring and control systems plans.
- To reduce predator perching, limit the construction of vertical facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs or SUAs to reduce disturbance to GRSG habitats.
- Co-locate new utility developments (power lines, pipelines, etc.) and transportation routes with existing utility or transportation corridors where adequate separation can be achieved in order to preserve grid reliability and ongoing maintenance.
- Bury distributive power lines of up to 35 kV where ground disturbance can be minimized. Where technology and economic factors allow, bury higher kV power lines.
- Preclude GRSG access to pits and tanks through use of practical techniques (e.g. covers, netting, birdballs, location, etc.).
- Equip tanks and other above ground facilities with structures or devices that discourage nesting and/or perching of raptors, corvids, and other predators.
- Control the spread and effects of Nevada Department of Agriculture listed noxious weeds (NAC 555.010, classes A through C, inclusive) and undesirable non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007). All projects within SGMA should have a noxious weed management plan in place prior to construction and operations.
- Reduce the potential for creating excessive or unintended mosquito habitat and associated risk of West Nile Virus impacts to sagegrouse. This can be implemented through minimizing drill and process pit and pond construction and, where necessary, size of drill and process pits and ponds (Doherty 2007).
- Reduce habitat for mosquitoes that vector West Nile virus. If West Nile virus has been identified as a concern in the project area, limit favorable mosquito habitat.
- Limit noise to less than 10 decibels above ambient measures one hour before sunrise until 9:00 a.m. within 3 miles of a lek of a lek during active lek season, March 1 through May 15 (Patricelli et al. 2010, Blickley et al. 2012, and Patricelli et al. 2013).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit new transmission towers with anti-perch devices (Lammers and Collopy 2007).

- Design and construct fences consistent with NRCS fence standards and specifications Code 382 and, where appropriate, use fence markers (Sage Grouse Initiative 2013) around sumps.
- Implement site keeping practices to preclude the accumulation of debris, solid waste, putrescible wastes, and other potential anthropogenic subsidies for predators of GRSG (Bui et al 2010).
- Locate man camps outside of priority GRSG habitats.

Reclamation

- Include objectives for ensuring habitat rehabilitation to meet GRSG
 habitat needs in reclamation practices/sites (Pyke 2011). Address
 post reclamation management in reclamation plans such that goals
 and objective are to protect and improve GRSG habitat needs.
- Reseed all areas requiring reclamation with a seed mixture appropriate for the soils, climate, and landform of the area to ensure recovery of the ecological processes and habitat features of the potential natural vegetation, and to prevent the invasion of noxious weeds or other exotic invasive species. Long-term monitoring is required to determine success.
- Maximize the area of interim and concurrent reclamation on infrastructure related disturbances through reshaping/regrading, topsoiling and revegetating cut and fill slopes. In coordination with appropriate agencies, consider development of fuel breaks in reclamation design.
- Ensure that all authorized ground disturbing projects have vegetation reclamation standards suitable for the site type prior to construction and ensure that reclamation to appropriate GRSG standards are budgeted for in the reclamation bond.
- Irrigate interim reclamation as necessary during dry periods when valid water rights exist.
- Utilize mulching techniques to expedite reclamation.

Salable and Non-Energy Minerals

Operations

- Cluster disturbances associated with operations and facilities as close as possible unless site specific conditions indicate that disturbances to sagebrush habitat would be reduced if operations and facilities locations would best fit a unique special arrangement.
- Minimize site disturbance though site analysis and facility planning.
- Place infrastructure in already disturbed locations where the habitat has not been restored.

- Apply a phased development approach with concurrent reclamation through a coordination process among relevant parties.
- Reduce motor vehicle travel during field operations through development and implementation of remote monitoring and control systems plans.
- To reduce predator perching, limit the construction of vertical facilities and fences to the minimum number and amount needed.
- Site or minimize linear ROWs or SUAs to reduce disturbance to sage-grouse habitats.
- Co-locate new utility developments (power lines, pipelines, etc.) and transportation routes with existing utility or transportation corridors where adequate separation can be achieved in order to preserve grid reliability and ongoing maintenance.
- Bury distributive power lines of up to 35 kV where ground disturbance can be minimized. Where technology and economic factors allow, bury higher kV power lines.
- Preclude sage-grouse access to pits and tanks through use of practical techniques (e.g. covers, netting, birdballs, location, etc.).
- Equip tanks and other above ground facilities with structures or devices that discourage nesting or perching of raptors, corvids, and other predators.
- Control the spread and effects of Nevada Department of Agriculture listed noxious weeds (NAC 555.010, classes A through C, inclusive) and undesirable non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).. All projects within SGMA should have a noxious weed management plan in place prior to construction and operations.
- Reduce the potential for creating excessive or unintended mosquito habitat and associated risk of West Nile Virus impacts to sagegrouse. This can be implemented through minimizing pit and pond construction and, where necessary, size of pits and ponds Where West Nile virus has been identified as a concern, restrict pond and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues and West Nile virus has been identified as a concern in the project area, use the steps described under "Fluid Minerals" for reservoir design to limit favorable mosquito habitat (Doherty 2007).

- Limit noise to less than 10 decibels above ambient measures one hour before sunrise until 9:00 a.m. within 3 miles of a lek during active lek season, March 1 through May 15 (Patricelli et al. 2010, Blickley et al. 2012, and Patricelli et al. 2013).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit new transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Design and construct fences consistent with NRCS fence standards and specifications Code 382 and, where appropriate, use fence markers (Sage Grouse Initiative 2013) around sumps.
- Implement site keeping practices to preclude the accumulation of debris, solid waste, putrescible wastes, and other potential anthropogenic subsidies for predators of sagegrouse (Bui et al 2010).
- Locate man camps outside of priority sage-grouse habitats.

Reclamation

- Include objectives for ensuring habitat rehabilitation to meet sagegrouse habitat needs in reclamation practices/sites (Pyke 2011).
 Address post reclamation management in reclamation plans such that goals and objective are to protect and improve sage-grouse habitat needs.
- Reseed all areas requiring reclamation with a seed mixture appropriate for the soils, climate, and landform of the area to ensure recovery of the ecological processes and habitat features of the potential natural vegetation, and to prevent the invasion of noxious weeds or other exotic invasive species. Long-term monitoring is required to determine success.
- Reclamation In coordination with appropriate agencies, consider development of fuel breaks in reclamation design.
- Maximize the area of interim and concurrent reclamation on infrastructure related disturbances through reshaping/regrading, topsoiling and revegetating cut and fill slopes. In coordination with appropriate agencies, consider development of fuel breaks in reclamation design.
- Ensure that all authorized ground disturbing projects have vegetation reclamation standards suitable for the site type prior to construction and ensure that reclamation to appropriate sagegrouse standards are budgeted for in the reclamation bond.
- Restore disturbed areas at final reclamation to near pre-disturbance landform and the desired plant community.

- Irrigate interim reclamation as necessary during dry periods when valid water rights exist.
- Utilize mulching techniques to expedite reclamation.

Fuels and Fire Management and Post-Fire Rehabilitation

 Fire and fuels operations should focus on protecting and enhancing occupied GRSG habitats. This includes taking into account the feasibility and cost of future rehabilitation efforts during Wildland Fire Decision Support Tree planning and general fire operations in all occupied GRSG habitats.

Fuels Management

- Design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore ecological function, and create landscape patterns which most benefit sage-grouse habitat.
- Incorporate resilience and resistance and other best available science concepts into fuels treatment planning activities
- Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas used locally.
- Fuels treatment project design in sagebrush and pinyon-juniper encroached sagebrush habitats must be based on the best available science. At a minimum, project proponents will consider best available science including: use of site appropriate state and transition models; ecological site characteristics; and, the evaluation of resilience to disturbance and resistance to invasive annual grasses.
- Ensure the proposed prescription burning plans meet the need of the resource via a comprehensive review by proponents, fire managers, wildlife biologists and resource managers, at a minimum.
- Use prescriptive fire use on project sites where state and transition models, ecological site descriptions and existing high site resilience/resistance are used as principle components of the prescription planning process. The desired outcome of all prescription fire use in appropriate sagebrush habitat is to minimize undesirable long-term effects on vegetation or soils (e.g., minimize mortality of desirable perennial herbaceous species and reduce risk of annual grass invasion).
- Ensure proposed sagebrush treatments are planned with full interdisciplinary input pursuant to NEPA and coordination with NDOW and SETT, and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.

- Incorporate roads and natural fuel breaks into fuel break design
- Utilize supervised livestock grazing as a tool to reduce fuels and control non-native species. Targeted grazing needs to be conducted within the framework of the sagegrouse habitat objectives (Table 4-1).
- Power-wash all vehicles and equipment involved in fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.
- Design vegetation treatments in areas of high fire frequency, which
 facilitate firefighter safety, reduce the potential acres burned, and
 reduce the fire risk to GRSG habitat. Additionally, develop maps for
 GRSG habitat, which spatially display existing fuels treatments that
 can be used to assist suppression activities.
- For implementing specific sage-grouse habitat rehabilitation projects in annual grasslands, first give priority to sites which are adjacent to or surrounded by Core Management Areas or that reestablish continuity between priority habitats. Annual grasslands are a second priority for rehabilitation when the sites are not adjacent to Core Management Areas, but within two miles of Core Management Areas. The third priority for annual grassland habitat restoration projects are sites beyond two miles of Core Management Areas. The intent is to focus restoration outward from existing, intact habitat. Within these criteria, projects should be prioritized based on probability of success based on current condition, ecological site and state-and-transition modeling if available.
- As funding and logistics permit, rehabilitate annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs with the goal of establishing a functional ecological site based on state-and-transition modeling and ecological site descriptions.
- Emphasize the use of native plant species, recognizing that nonnative species may be necessary depending on the availability of native seed and prevailing site conditions
- Based on ecological site descriptions, remove encroaching pinyon and juniper trees from areas within at least 3 kilometers (1.86 miles) of occupied GRSG leks (Connelly et al. 2000) and from other limiting habitats at least 850 meters (e.g., nesting, wintering and brood rearing) to reduce the availability of perch sites for avian predators, as resources permit (Connelly et al 2000, Casazza et al. 2011).
- Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.

- Reduce the risk of vehicle- or human-caused wildfires and the spread of invasive species by installing and maintaining fuel breaks and/or planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, targeted grazing, etc.) to aid in controlling wildfire, should wildfire occur near SGMA or important restoration areas (such as where investments in restoration have already been made).
- All fuels management projects should include short and long term monitoring to ensure success and provide for adaptive management. Multiple revegetation entries may be required to ensure success.

Fire Management

- Compile state and local government/District/Forest level information into state-wide sage-grouse tool boxes. Tool boxes will contain maps, listing of state and local resource advisors, contact information, local guidance, and other relevant information for each state and local government/District/Forest, which will be aggregated into a state-wide document. Update the toolbox annually or continually.
- Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
- Assign a state and/or local resource advisor with GRSG expertise, or who has access to GRSG expertise, to all extended attack fires in or near GRSG habitat. Prior to the fire season, provide training to GRSG resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals. Involve state wildlife agency expertise in fire operations through:
 - instructing resource advisors during preseason trainings;
 - qualification as resource advisors;
 - coordination with resource advisors during fire incidents
 - contributing to incident planning with information such as habitat features or other key data useful in fire decision making.
- On critical fire weather days, pre-position additional local, state, and federal fire suppression resources to optimize a quick and efficient response in GRSG habitat areas.
- Encourage local resources (volunteer fire departments and country equipment) to respond to initial attack efforts and further encourage these agencies to obtain required ICS training to be able

- to run incidents for longer periods when needed during critical fire periods.
- During periods of multiple fires, ensure line officers, in consultation with state and local resource advisors are involved in setting priorities.
- To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases, etc.) in areas where physical disturbance to GRSG habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
- Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles (ATV) prior to deploying in or near GRSG habitat areas to minimize noxious weed spread. Minimize unnecessary cross-country vehicle travel during fire operations in GRSG habitat.
- Minimize burnout operations in key GRSG habitat areas by constructing direct fire line whenever safe and practical to do so.
- Utilize retardant, mechanized equipment, and other available resources to minimize burned acreage during initial attack.
- As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.
- Adequately document fire operation activities in GRSG habitat for potential follow-up coordination activities.
- Coordinate and utilize local fire suppression resources to the maximum extent possible.
- Eliminate "burning out" islands and fingers of unburned GRSG habitat, unless lives and property are at risk.

Post-Fire Rehabilitation

- Emphasis should be on fall revegetation to ensure greatest likelihood of success.
- All post-fire rehabilitation projects should include short- and long-term monitoring to ensure success and provide for adaptive management. Multiple revegetation entries may be required to ensure success. Emphasize the use of native plant species in post-fire rehabilitation, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions. Selected species maintain site ecological function based on pre-burn conditions and anticipated threat of invasive and

- noxious weed establishment. Use ecological site descriptions and state-and-transition models if available.
- Reseed all burned areas requiring rehabilitation with a seed mixture
 appropriate for the soils, climate, and landform of the area to
 ensure recovery of the ecological processes and habitat features of
 the potential natural vegetation, and to prevent the invasion of
 noxious weeds or other exotic invasive species. Long-term
 monitoring is required to determine success.
- Power-wash all vehicles and equipment prior to entering sagegrouse habitat rehabilitation/restoration areas to minimize noxious weed spread. Minimize unnecessary cross-country vehicle travel during rehabilitation/restoration operations in sage-grouse habitat.
- Consider Integrated Pest Management (IPM) practices to ensure greater initial control of invasive and noxious plant species.
- Sage-grouse seasonal habitat requirements must be considered when selecting revegetation materials in all burned potential and current sage-grouse habitat.
- Prioritize shrub island plantings in large burn areas which may lack sufficient shrub seed sources, in order to ensure the reestablishment of the shrub component.

Vegetation Management

- Avoid sagebrush removal in sage-grouse breeding or wintering habitats.
- Maintain all remaining large intact sagebrush patches, particularly at low elevations, through active management, in order to increase resistance and resilience to reduce the risk of being lost to wildfire.
- Limit habitat treatments in winter ranges to actions that maintain or expand current or needed levels of sagebrush available in winter.

Lands and Realty

Leases and Permits

 Permits and leases must include stipulations to minimize impacts to sage-grouse and sage-grouse habitat based upon the specific activity and ensure no net loss of sagegrouse habitat.

Right-of-Ways (ROWs)

 Work with existing rights-of-way holders to encourage installation of perch guards on all poles where existing utility poles are located within 5 km (3.2 miles) of known leks (Coates et al. 2013).

- Use existing utility corridors and consolidate rights-of-way to reduce habitat loss, degradation, and fragmentation. Install new power lines within existing utility corridors.
- Where sage-grouse conservation opportunities exist, BLM field offices and Forests should work in cooperation with rights-of-way holders to conduct maintenance and operation activities, authorized under an approved ROW grant, to avoid and minimize effect on sage-grouse habitat.
- When renewing or amending ROWs, assess the impacts of ongoing use of the ROW to sage-grouse habitat and incorporate stipulations, which minimize such impacts to the extent allowed by law.
- Conduct pre-application meetings with the BLM or Forest Service and SETT for all new ROW proposals consistent with the ROW regulations (43 CFR 2804.10) and consistent with current renewable energy ROW policy guidance (WO-IM-2011-061, issued February, 2011). Assess the impact of the proposed ROW on GRSG and its habitat, and implement the following: Ensure that reasonable alternatives for siting the ROW outside of GRSG habitat or within a BLM designated utility corridor are considered and analyzed in the NEPA document; and identify technically feasible best management practices, conditions, (e.g., siting, burying power lines) that may be implemented in order to eliminate or minimize impacts.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Authorize ROWs for wind energy development projects by applying appropriate Design Features as specified in the BLM Wind Energy Development EIS (BLM 2005), land use restrictions, stipulations, and mitigation measures.
- Bury distribution power lines of up to 35kV where ground disturbance can be minimized. Where technology and economic factors allow, bury higher kV power lines.
- Where existing leases or rights-of-way (ROWs) have had some level of development (road, fence, well, etc.) and are no longer in use, reclaim the site by removing these features, without interfering with valid pre-existing rights, and restoring the habitat.
- Within designated ROW corridors encumbered by existing ROW authorizations: new ROWs should be co-located to the extent practical and feasible with the entire footprint of the proposed project adjacent to or within the existing disturbance associated

- with the authorized ROWs taking into account operational requirements and safety.
- Subject to valid, existing rights, where new ROWs associated with valid existing rights are required, co-locate new ROWs within existing ROWs or where it best minimizes sage-grouse impacts. Use existing roads, or realignments as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new road constructed to the minimum standard necessary.
- Upon project completion, roads used for commercial access on public lands would be reclaimed, unless, based on site-specific analysis, the route provides specific benefits for public access and does not contribute to resource conflicts.
- Construct new power lines outside of sage-grouse habitat wherever possible. If power lines cannot be sited outside of sage-grouse habitat, site power lines in the least suitable habitat possible or bury power lines, where technology and economic factors allow.
- Remove power lines that traverse important sage-grouse habitats when facilities being serviced are no longer in use or when projects are completed.
- Install anti-perching and anti-nesting measures on new tall structures, such as power lines, commensurate with the design of the structures.

Travel and Transportation

- Work with local government to enforce speed limits and design roads to be driven at speeds appropriate to minimize vehicle/wildlife collisions.
- Conduct rehabilitation of roads, primitive roads, and trails not
 designated in travel management plans where such plans exist and
 have been approved for implementation. This also includes primitive
 route/roads that were not designated in wilderness study areas and
 within lands managed for wilderness characteristics that have been
 selected for protection, with due consideration given to any
 historical significance of existing trails.
- When reseeding roads, primitive roads, and trails, use appropriate seed mixes and consider the use of transplanted sagebrush in order to meet sage-grouse habitat restoration objectives (Table 4-I).
 Where invasive annual grasses are present, herbicides may be used to enhance the effectiveness of any seeding and to also establish islands of desirable species for dispersion.
- Use existing roads, or realignments to access valid existing rights that are not yet developed. If valid existing rights cannot be

- accessed via existing roads, then any new roads would be constructed to the minimum standard necessary to support the intended use.
- Work with local governments to minimize upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless the upgrading would have minimal impact on sage-grouse habitat, is necessary for motorist safety, or eliminates the need to construct a new road, while providing for the intended use.
- Manage on-road travel and OHV use in key grouse areas to avoid disturbance during critical times such as winter and nesting periods.
- Consider road removal, realignment, or seasonal closures where appropriate to avoid degradation of habitat and /or to avoid disturbance during critical periods of the sage-grouse life cycle.

Recreation

- Special recreation permits must have stipulations to minimize impacts to sage-grouse and sage-grouse habitat based upon the specific activity and ensures no net unmitigated loss of sage-grouse habitat.
- Issue special recreation permits with appropriate distance and timing restrictions to minimize impacts to seasonal sage-grouse habitat.
- Develop trail mapping, and educational campaigns to reduce recreational impacts on sage-grouse, including effects of cross country travel.
- Where feasible, locate recreation trails strategically to create or augment fuel breaks in the margins of sage-grouse habitats and landscapes and not create roads or trails where they cause net negative direct and indirect impacts.
- Take measures to minimize or reduce activities and to avoid an ambient noise level increase >10 dB at the edge of leks during the lekking season generally, March I through May 15 from one hour before sunrise until 9:00 a.m. (Patricelli et al. 2010, Blickley et al. 2012, Patricelli et al. 2013).

Energy Development and Infrastructure

 Adopt standards outlined in Nevada Energy and Infrastructure Development Standards to Conserve Greater Sage-grouse Populations and Their Habitats, April 2010, pgs. 25-29 (Appendix G).

Wild Horses and Burros

• When conducting NEPA analysis for wild horse and burro management activities, water developments or other rangeland improvements for wild horses in sage-grouse habitat, address the direct and indirect effects to sage-grouse populations and habitat. Implement any water developments or rangeland improvements using the criteria for wild horses and burros year around use and consistent with necessary rights and right of ways in sage-grouse habitats. Incorporate the NRCS water development standards and additional criteria listed below, including Codes 614, 574, 533, 642, and 516.

Livestock Grazing and Range Management

- Where applicable and as part of a ranch management plan, use the Natural Resource Conservation Service (NRCS) Conservation Practice Standards and Specification listed below. In addition, use the recommendations additions to the standards developed by NRCS and NDOW as part of NRCS' Sage-grouse Initiative and further expanded by the state of Nevada in this document:
 - Code 645: Upland Wildlife Habitat Management
 - Code 528: Prescribed Grazing
 - Emphasize rest periods and/ or seasonal deferment when appropriate as part of the grazing management plan and restoration.
 - Code 614: Water Facilities
 - Avoid placement where existing sagebrush cover will be reduced near a lek, in nesting habitat, or winter habitat whenever possible. NDOW recommends structures be at least 1 mile from a lek.
 - Code 574: Spring Development
 - Springs may be developed as long as valid water claims or rights exist and development shows a net benefit to overall habitat within a SGMA.
 - Code 533: Pumping Plant
 - NDOW recommends the structure should not be placed within 3 miles of a lek to avoid disturbance to nesting sage-grouse.

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¹ These USDA; NRCS Conservation Practice Codes as well as others can be found at: http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/references/?cid=nrcs143_026849

Code 642: Water Well

Well placement should encourage dispersion of livestock and provide for a neutral or no net negative impact to habitat within a SGMA. Further water developments will decrease concentrated livestock and wildlife use and further protect sagebrush habitats.

Code 516: Livestock Pipeline

- Pipelines shall be replaced as needed to provide for better dispersion of livestock.
- Pipelines shall be replaced along existing pipelines, roadways, or fences.
- Replacement and maintenance of pipelines shall use the least invasive techniques and extensive work requiring heavy equipment shall be done in a manner consistent with season of use by the GRSG (i.e. replacing improvements in GRSG winter habitat during the summer and replacing improvements in breeding and nesting habitat during the fall)
- Replacement of improvements shall be allowed in order to not jeopardize existing and valid claims and rights.

Code 410: Grade Stabilization Structure

If possible, avoid the installation of these structures during the late summer brood rearing period. NDOW recommends structure placement in mid-September through late November.

Code 382: Fence

- If possible, fencing should not be constructed near a lek and should be avoided in winter habitats near ridges. To make a fence more visible, use white tipped metal fence posts, securing flagging or reflectors to the top fence wires, or slide sections of PVC pipe over the top wire (Stevenson and Reece 2012).
- Relocate or modify existing water developments (including locating troughs to further disperse livestock) that are having a net negative impact on GRSG habitats. Any changes to existing water developments must be conducted in accordance with State Water Law and in close consultation with the water right owner in order to avoid a "taking" of private property water rights.
- All troughs should be outfitted with the appropriate type and number of wildlife escape ramps.

 All field and district offices should apply BLM IM 2013-094 or similar methodology until superseded related to drought management planning.

Surface Disturbing Activities - General

- During the period specified, manage discretionary surface disturbing activities and uses to prevent disturbance to GRSG during life cycle periods. Seasonal protection is identified for the following:
 - Seasonal protection within three (3) miles of active GRSG leks from March 1 through June 15 during lekking hours of 1-hour before sunrise until 9:00 am.
 - Seasonal protection of GRSG suitable wintering areas from November 1 through March 31;
 - Seasonal protection of GRSG suitable brood-rearing habitat from May 15 to August 15.
- Implement appropriate time-of-day and/or time-of year restrictions for future construction and/or maintenance activities in known GRSG habitat
- Reseed all areas requiring reclamation with a seed mixture appropriate for the soils, climate, and landform of the area to ensure recovery of the ecological processes and habitat features of the potential natural vegetation, and to prevent the invasion of noxious weeds or other exotic invasive species. Long-term monitoring is required to determine success.
- Minimize the footprint of disturbances to avoid or minimize the potential for invasive plant infestations. When possible, do not remove native vegetation. Monitor, report, and treat all disturbance sites that become occupied by invasive plants, primarily cheatgrass, and all state listed noxious weeds. Pre- and post-disturbance activities must include prevention strategies prior to entering sites. Treatments, restoration, and monitoring are required for a minimum of three years or until the site is deemed noxious and invasive weed free following the disturbance. Reporting should be sent to the Nevada Department of Agriculture via the EDDMapS link on their website.
- Maximize the area of interim reclamation on long-term surface disturbing activities to including reshaping, topsoiling and revegetating areas no longer being disturbed within the overall project foot print.

Miscellaneous

 In Wilderness and Wilderness Study Areas (WSA), the state of Nevada will work with the federal land management agencies to investigate the use of mechanized equipment in those areas in conformance with the Wilderness Act, Federal Land Policy and Management Act, and National Forest Management Act. The State will also support congressional efforts to investigate and responsibly use additional techniques (including mechanized) to protect or restore areas that exhibit unique or emergency circumstances (fire, P/J expansion, invasive weeds infestations, excessive fuels, etc.) in order to protect the area from long term resource damage.

 Work with federal, state, and local governments and project proponents to minimize anthropogenic subsidies for predators, including ravens. This page intentionally left blank.

Appendix E

Greater Sage-Grouse Monitoring Framework

THE GREATER SAGE-GROUSE MONITORING FRAMEWORK

Bureau of Land Management U.S. Forest Service

Developed by the Interagency Greater Sage-Grouse Disturbance and Monitoring Subteam

May 30, 2014

The Greater Sage-Grouse Monitoring Framework

Developed by the Interagency Greater Sage-Grouse Disturbance and Monitoring Subteam

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INTRODUCTION

The purpose of this U.S. Bureau of Land Management (BLM) and U.S. Forest Service (USFS) Greater Sage-Grouse Monitoring Framework (hereafter, monitoring framework) is to describe the methods to monitor habitats and evaluate the implementation and effectiveness of the BLM's national planning strategy (attachment to BLM Instruction Memorandum 2012-044), the BLM resource management plans (RMPs), and the USFS's land management plans (LMPs) to conserve the species and its habitat. The regulations for the BLM (43 CFR 1610.4-9) and the USFS (36 CFR part 209, published July 1, 2010) require that land use plans establish intervals and standards, as appropriate, for monitoring and evaluations based on the sensitivity of the resource to the decisions involved. Therefore, the BLM and the USFS will use the methods described herein to collect monitoring data and to evaluate implementation and effectiveness of the Greater Sage-Grouse (GRSG) (hereafter, sage-grouse) planning strategy and the conservation measures contained in their respective land use plans (LUPs). A monitoring plan specific to the Environmental Impact Statement, land use plan, or field office will be developed after the Record of Decision is signed. For a summary of the frequency of reporting, see Attachment A, An Overview of Monitoring Commitments. Adaptive management will be informed by data collected at any and all scales.

To ensure that the BLM and the USFS are able to make consistent assessments about sage-grouse habitats across the range of the species, this framework lays out the methodology—at multiple scales—for monitoring of implementation and disturbance and for evaluating the effectiveness of BLM and USFS actions to conserve the species and its habitat. Monitoring efforts will include data for measurable quantitative indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions. Implementation monitoring results will allow the BLM and the USFS to evaluate the extent that decisions from their LUPs to conserve sage-grouse and their habitat have been implemented. State fish and wildlife agencies will collect population monitoring information, which will be incorporated into effectiveness monitoring as it is made available.

This multiscale monitoring approach is necessary, as sage-grouse are a landscape species and conservation is scale-dependent to the extent that conservation actions are implemented within seasonal habitats to benefit populations. The four orders of habitat selection (Johnson 1980) used in this monitoring framework are described by Connelly et al. (2003) and were applied specifically to the scales of sage-grouse habitat selection by Stiver et al. (*in press*) as first order (broad scale), second order (mid scale), third order (fine scale), and fourth order (site scale). Habitat selection and habitat use by sage-grouse occur at multiple scales and are driven by multiple environmental and behavioral factors. Managing and monitoring sage-grouse habitats are complicated by the differences in habitat selection across the range and habitat use by individual birds within a given season. Therefore, the tendency to look at a single indicator of habitat suitability or only one scale limits managers' ability to identify the threats to sage-grouse

and to respond at the appropriate scale. For descriptions of these habitat suitability indicators for each scale, see "Sage-Grouse Habitat Assessment Framework: Multiscale Habitat Assessment Tool" (HAF; Stiver et al. *in press*).

Monitoring methods and indicators in this monitoring framework are derived from the current peer-reviewed science. Rangewide, best available datasets for broad- and mid-scale monitoring will be acquired. If these existing datasets are not readily available or are inadequate, but they are necessary to inform the indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions, the BLM and the USFS will strive to develop datasets or obtain information to fill these data gaps. Datasets that are not readily available to inform the fine- and site-scale indicators will be developed. These data will be used to generate monitoring reports at the appropriate and applicable geographic scales, boundaries, and analysis units: across the range of sage-grouse as defined by Schroeder et al. (2004), and clipped by Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone (MZ) (Stiver et al. 2006) boundaries and other areas as appropriate for size (e.g., populations based on Connelly et al. 2004). (See Figure 1, Map of Greater Sage-Grouse range, populations, subpopulations, and Priority Areas for Conservation as of 2013.) This broad- and mid-scale monitoring data and analysis will provide context for RMP/LMP areas; states; GRSG Priority Habitat, General Habitat, and other sagegrouse designated management areas; and Priority Areas for Conservation (PACs), as defined in "Greater Sage-grouse (Centrocercus urophasianus) Conservation Objectives: Final Report" (Conservation Objectives Team [COT] 2013). Hereafter, all of these areas will be referred to as "sage-grouse areas."

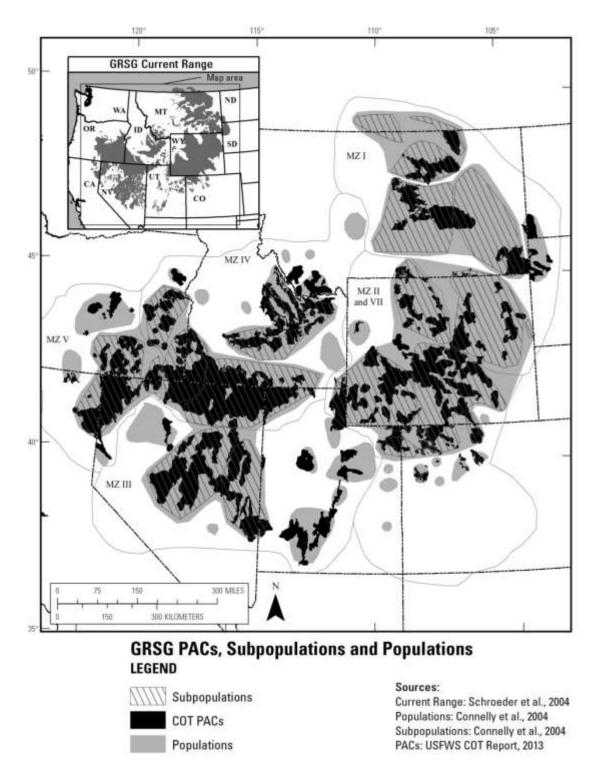


Figure 1. Map of Greater Sage-Grouse range, populations, subpopulations, and Priority Areas for Conservation as of 2013.

This monitoring framework is divided into two sections. The broad- and mid-scale methods, described in Section I, provide a consistent approach across the range of the species to monitor implementation decisions and actions, mid-scale habitat attributes (e.g., sagebrush availability and habitat degradation), and population changes to determine the effectiveness of the planning strategy and management decisions. (See Table 1, Indicators for monitoring implementation of the national planning strategy, RMP/LMP decisions, sage-grouse habitat, and sage-grouse populations at the broad and mid scales.) For sage-grouse habitat at the fine and site scales, described in Section II, this monitoring framework describes a consistent approach (e.g., indicators and methods) for monitoring sage-grouse seasonal habitats. Funding, support, and dedicated personnel for broad- and mid-scale monitoring will be renewed annually through the normal budget process. For an overview of BLM and USFS multiscale monitoring commitments, see Attachment A.

Table 1. Indicators for monitoring implementation of the national planning strategy, RMP/LMP decisions, sage-grouse habitat, and sage-grouse populations at the broad and mid scales

decision	decisions, sage-grouse habitat, and sage-grouse populations at the broad and mid scales.					
	Implementation	Habitat		Population (State Wildlife Agencies)		
Geographic Scales		Availability	Degradation	Demographics		
Broad Scale: From the range of sage- grouse to WAFWA Management Zones	BLM/USFS National planning strategy goal and objectives	Distribution and amount of sagebrush within the range	Distribution and amount of energy, mining, and infrastructure facilities	WAFWA Management Zone population trend		
Mid Scale: From WAFWA Management Zone to populations; PACs	RMP/LMP decisions	Mid-scale habitat indicators (HAF; Table 2 herein, e.g., percent of sagebrush per unit area)	Distribution and amount of energy, mining, and infrastructure facilities (Table 2 herein)	Individual population trend		

I. BROAD AND MID SCALES

First-order habitat selection, the broad scale, describes the physical or geographical range of a species. The first-order habitat of the sage-grouse is defined by populations of sage-grouse associated with sagebrush landscapes, based on Schroeder et al. 2004, and Connelly et al. 2004, and on population or habitat surveys since 2004. An intermediate scale between the broad and mid scales was delineated by WAFWA from floristic provinces within which similar environmental factors influence vegetation communities. This scale is referred to as the WAFWA Sage-Grouse Management Zones (MZs). Although no indicators are specific to this scale, these MZs are biologically meaningful as reporting units.

Second-order habitat selection, the mid-scale, includes sage-grouse populations and PACs. The second order includes at least 40 discrete populations and subpopulations (Connelly et al. 2004). Populations range in area from 150 to 60,000 mi² and are nested within MZs. PACs range from 20 to 20,400 mi² and are nested within population areas.

Other mid-scale landscape indicators, such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*) will also be assessed. The methods used to calculate these metrics will be derived from existing literature (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011).

A. Implementation (Decision) Monitoring

Implementation monitoring is the process of tracking and documenting the implementation (or the progress toward implementation) of RMP/LMP decisions. The BLM and the USFS will monitor implementation of project-level and/or site-specific actions and authorizations, with their associated conditions of approval/stipulations for sage-grouse, spatially (as appropriate) within Priority Habitat, General Habitat, and other sage-grouse designated management areas, at a minimum, for the planning area. These actions and authorizations, as well as progress toward completing and implementing activity-level plans, will be monitored consistently across all planning units and will be reported to BLM and USFS headquarters annually, with a summary report every 5 years, for the planning area. A national-level GRSG Land Use Plan Decision Monitoring and Reporting Tool is being developed to describe how the BLM and the USFS will consistently and systematically monitor and report implementation-level activity plans and implementation actions for all plans within the range of sage-grouse. A description of this tool for collection and reporting of tabular and spatially explicit data will be included in the Record of Decision or approved plan. The BLM and the USFS will provide data that can be integrated with other conservation efforts conducted by state and federal partners.

B. Habitat Monitoring

The U.S. Fish and Wildlife Service (USFWS), in its 2010 listing decision for the sage-grouse, identified 18 threats contributing to the destruction, modification, or curtailment of sage-grouse habitat or range (75 FR 13910 2010). The BLM and the USFS will, therefore, monitor the relative extent of these threats that remove sagebrush, both spatially and temporally, on all lands within an analysis area, and will report on amount, pattern, and condition at the appropriate and applicable geographic scales and boundaries. These 18 threats have been aggregated into three broad- and mid-scale measures to account for whether the threat predominantly removes sagebrush or degrades habitat. (See Table 2, Relationship between the 18 threats and the three habitat disturbance measures for monitoring.) The three measures are:

Measure 1: Sagebrush Availability (percent of sagebrush per unit area)

Measure 2: Habitat Degradation (percent of human activity per unit area)

Measure 3: Energy and Mining Density (facilities and locations per unit area)

These three habitat disturbance measures will evaluate disturbance on all lands, regardless of land ownership. The direct area of influence will be assessed with the goal of accounting for actual removal of sagebrush on which sage-grouse depend (Connelly et al. 2000) and for habitat degradation as a surrogate for human activity. Measure 1 (sagebrush availability) examines where disturbances have removed plant communities that support sagebrush (or have broadly removed sagebrush from the landscape). Measure 1, therefore, monitors the change in sagebrush availability—or, specifically, where and how much of the sagebrush community is available within the range of sage-grouse. The sagebrush community is defined as the ecological systems that have the capability of supporting sagebrush vegetation and seasonal sage-grouse habitats within the range of sage-grouse (see Section I.B.1., Sagebrush Availability). Measure 2 (see Section I.B.2., Habitat Degradation Monitoring) and Measure 3 (see Section I.B.3., Energy and Mining Density) focus on where habitat degradation is occurring by using the footprint/area of direct disturbance and the number of facilities at the mid scale to identify the relative amount of degradation per geographic area of interest and in areas that have the capability of supporting sagebrush and seasonal sage-grouse use. Measure 2 (habitat degradation) not only quantifies footprint/area of direct disturbance but also establishes a surrogate for those threats most likely to have ongoing activity. Because energy development and mining activities are typically the most intensive activities in sagebrush habitat, Measure 3 (the density of active energy development, production, and mining sites) will help identify areas of particular concern for such factors as noise, dust, traffic, etc. that degrade sage-grouse habitat.

Table 2. Relationship between the 18 threats and the three habitat disturbance measures for monitoring.

Note: Data availability may preclude specific analysis of individual layers. See the detailed methodology for more information.

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	O	
Agriculture	X			
Urbanization	X			
Wildfire	X			
Conifer encroachment	X			
Treatments	X			
Invasive Species	X			
Energy (oil and gas wells and development facilities)		X	X	
Energy (coal mines)		X	X	
Energy (wind towers)		X	X	
Energy (solar fields)		X	X	
Energy (geothermal)		X	X	
Mining (active locatable, leasable, and saleable developments)		X	X	
Infrastructure (roads)		X		
Infrastructure (railroads)		X		
Infrastructure (power lines)		X		
Infrastructure (communication towers)		X		
Infrastructure (other vertical structures)		X		
Other developed rights-of-way		X		

The methods to monitor disturbance found herein differ slightly from methods used in Manier et al. 2013, which provided a baseline environmental report (BER) of datasets of disturbance across jurisdictions. One difference is that, for some threats, the BER data were for federal lands only. In addition, threats were assessed individually, using different assumptions from those in this monitoring framework about how to quantify the location and magnitude of threats. The methodology herein builds on the BER methodology and identifies datasets and procedures to use the best available data across the range of the sage-grouse and to formulate a consistent approach to quantify impact of the threats through time. This methodology also describes an approach to combine the threats and calculate each of the three habitat disturbance measures.

B.1. Sagebrush Availability (Measure 1)

Sage-grouse populations have been found to be more resilient where a percentage of the landscape is maintained in sagebrush (Knick and Connelly 2011), which will be determined by sagebrush availability. Measure 1 has been divided into two submeasures to describe sagebrush availability on the landscape:

Measure 1a: the current amount of sagebrush on the geographic area of interest, and

Measure 1b: the amount of sagebrush on the geographic area of interest compared with the amount of sagebrush the landscape of interest could ecologically support.

Measure 1a (the current amount of sagebrush on the landscape) will be calculated using this formula: [the existing updated sagebrush layer] divided by [the geographic area of interest]. The appropriate geographic areas of interest for sagebrush availability include the species' range, WAFWA MZs, populations, and PACs. In some cases these sage-grouse areas will need to be aggregated to provide an estimate of sagebrush availability with an acceptable level of accuracy.

Measure 1b (the amount of sagebrush for context within the geographic area of interest) will be calculated using this formula: [existing sagebrush divided by [pre-EuroAmerican settlement geographic extent of lands that could have supported sagebrush]. This measure will provide information to set the context for a given geographic area of interest during evaluations of monitoring data. The information could also be used to inform management options for restoration or mitigation and to inform effectiveness monitoring.

The sagebrush base layer for Measure 1 will be based on geospatial vegetation data adjusted for the threats listed in Table 2. The following subsections of this monitoring framework describe the methodology for determining both the current availability of sagebrush on the landscape and the context of the amount of sagebrush on the landscape at the broad and mid scales.

a. Establishing the Sagebrush Base Layer

The current geographic extent of sagebrush vegetation within the rangewide distribution of sagegrouse populations will be ascertained using the most recent version of the Existing Vegetation Type (EVT) layer in LANDFIRE (2013). LANDFIRE EVT was selected to serve as the sagebrush base layer for five reasons: 1) it is the only nationally consistent vegetation layer that has been updated multiple times since 2001; 2) the ecological systems classification within LANDFIRE EVT includes multiple sagebrush type classes that, when aggregated, provide a more accurate (compared with individual classes) and seamless sagebrush base layer across jurisdictional boundaries; 3) LANDFIRE performed a rigorous accuracy assessment from which to derive the rangewide uncertainty of the sagebrush base layer; 4) LANDFIRE is consistently used in several recent analyses of sagebrush habitats (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011); and 5) LANDFIRE EVT can be compared against the geographic extent of lands that are believed to have had the capability of supporting sagebrush vegetation pre-Euro American settlement [LANDFIRE Biophysical Setting (BpS)]. This fifth reason provides a reference point for understanding how much sagebrush currently remains in a defined geographic area of interest compared with how much sagebrush existed historically (Measure 1b). Therefore, the BLM and the USFS have determined that LANDFIRE provides the best available data at broad and mid scales to serve as a sagebrush base layer for monitoring changes in the geographic extent of sagebrush. The BLM and the USFS, in addition to aggregating the sagebrush types into the sagebrush base layer, will aggregate the accuracy assessment reports from LANDFIRE to document the cumulative accuracy for the sagebrush base layer. The BLM—through its Assessment, Inventory, and Monitoring (AIM) program and, specifically, the BLM's landscape monitoring framework (Taylor et al. 2014)—will provide field data to the LANDFIRE program to support continuous quality improvements of the LANDFIRE EVT layer. The sagebrush layer based on LANDFIRE EVT will allow for the mid-scale estimation of the existing percent of sagebrush across a variety of reporting units. This sagebrush base layer will be adjusted by changes in land cover and successful restoration for future calculations of sagebrush availability (Measures 1a and 1b).

This layer will also be used to determine the trend in other landscape indicators, such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*). In the future, changes in sagebrush availability, generated annually, will be included in the sagebrush base layer. The landscape metrics will be recalculated to examine changes in pattern and abundance of sagebrush at the various geographic boundaries. This information will be included in effectiveness monitoring (See Section I.D., Effectiveness Monitoring).

Within the USFS and the BLM, forest-wide and field office—wide existing vegetation classification mapping and inventories are available that provide a much finer level of data than what is provided through LANDFIRE. Where available, these finer-scale products will be useful for additional and complementary mid-scale indicators and local-scale analyses (see Section II,

Fine and Site Scales). The fact that these products are not available everywhere limits their utility for monitoring at the broad and mid scale, where consistency of data products is necessary across broader geographies.

Data Sources for Establishing and Monitoring Sagebrush Availability

There were three criteria for selecting the datasets for establishing and monitoring the change in sagebrush availability (Measure 1):

- Nationally consistent dataset available across the range
- Known level of confidence or accuracy in the dataset
- Continual maintenance of dataset and known update interval

Datasets meeting these criteria are listed in Table 3, Datasets for establishing and monitoring changes in sagebrush availability.

LANDFIRE Existing Vegetation Type (EVT) Version 1.2

LANDFIRE EVT represents existing vegetation types on the landscape derived from remote sensing data. Initial mapping was conducted using imagery collected in approximately 2001. Since the initial mapping there have been two update efforts: version 1.1 represents changes before 2008, and version 1.2 reflects changes on the landscape before 2010. Version 1.2 will be used as the starting point to develop the sagebrush base layer.

Sage-grouse subject matter experts determined which of the ecological systems from the LANDFIRE EVT to use in the sagebrush base layer by identifying the ecological systems that have the capability of supporting sagebrush vegetation and that could provide suitable seasonal habitat for the sage-grouse. (See Table 4, Ecological systems in BpS and EVT capable of supporting sagebrush vegetation and capable of providing suitable seasonal habitat for Greater Sage-Grouse.) Two additional vegetation types that are not ecological systems were added to the EVT: *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance. These alliances have species composition directly related to the Rocky Mountain Lower Montane-Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system, both of which are ecological systems in LANDFIRE BpS. In LANDFIRE EVT, however, in some map zones, the Rocky Mountain Lower Montane-Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system were named *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance, respectively.

Table 3. Datasets for establishing and monitoring changes in sagebrush availability.

Dataset	Source	Update Interval	Most Recent Version Year	Use
BioPhysical Setting v1.1	LANDFIRE	Static	2008	Denominator for sagebrush availability
Existing Vegetation Type v1.2	LANDFIRE	Static	2010	Numerator for sagebrush availability
Cropland Data Layer	National Agricultural Statistics Service	Annual	2012	Agricultural updates; removes existing sagebrush from numerator of sagebrush availability
National Land Cover Dataset Percent Imperviousness	Multi-Resolution Land Characteristics Consortium (MRLC)	5-Year	2011 (next available in 2016)	Urban area updates; removes existing sagebrush from numerator of sagebrush availability
Fire Perimeters	GeoMac	Annual	2013	< 1,000-acre fire updates; removes existing sagebrush from numerator of sagebrush availability
Burn Severity	Monitoring Trends in Burn Severity	Annual	2012 (2-year delay in data availability)	> 1,000-acre fire updates; removes existing sagebrush from numerator of sagebrush availability except for unburned sagebrush islands

Table 4. Ecological systems in BpS and EVT capable of supporting sagebrush vegetation and capable of providing suitable seasonal habitat for Greater Sage-Grouse.

1 5	
Ecological System	Sagebrush Vegetation that the Ecological System has
	the Capability of Producing
Colorado Plateau Mixed Low Sagebrush	Artemisia arbuscula ssp. longiloba
Shrubland	Artemisia bigelovii
	Artemisia nova
	Artemisia frigida
	Artemisia tridentata ssp. wyomingensis
Columbia Plateau Low Sagebrush Steppe	Artemisia arbuscula
	Artemisia arbuscula ssp. longiloba
	Artemisia nova

Columbia Plateau Scabland Shrubland	Artemisia rigida
Columbia Plateau Steppe and Grassland	Artemisia spp.
Great Basin Xeric Mixed Sagebrush	Artemisia arbuscula ssp. longicaulis
Shrubland	Artemisia arbuscula ssp. longiloba
	Artemisia nova
	Artemisia tridentata ssp. wyomingensis
Inter-Mountain Basins Big Sagebrush	Artemisia tridentata ssp. tridentata
Shrubland	Artemisia tridentata ssp. xericensis
	Artemisia tridentata ssp. vaseyana
	Artemisia tridentata ssp. wyomingensis
Inter-Mountain Basins Big Sagebrush	Artemisia cana ssp. cana
Steppe	Artemisia tridentata ssp. tridentata
	Artemisia tridentata ssp. xericensis
	Artemisia tridentata ssp. wyomingensis
	Artemisia tripartita ssp. tripartita
	Artemisia frigida
Inter-Mountain Basins Curl-Leaf Mountain	Artemisia tridentata ssp. vaseyana
Mahogany Woodland and Shrubland	Artemisia arbuscula
	Artemisia tridentata
Inter-Mountain Basins Mixed Salt Desert	Artemisia tridentata ssp. wyomingensis
Scrub	Artemisia spinescens
Inter-Mountain Basins Montane Sagebrush	Artemisia tridentata ssp. vaseyana
Steppe	Artemisia tridentata ssp. wyomingensis
	Artemisia nova
	Artemisia arbuscula
	Artemisia tridentata ssp. spiciformis
Inter-Mountain Basins Semi-Desert Shrub-	Artemisia tridentata
Steppe	Artemisia bigelovii
N. d. C. (Pl.) MC 1C	Artemisia tridentata ssp. wyomingensis
Northwestern Great Plains Mixed Grass	Artemisia cana ssp. cana
Prairie	Artemisia tridentata ssp. vaseyana
Newthern day Coast District Charles d	Artemisia frigida
Northwestern Great Plains Shrubland	Artemisia cana ssp. cana
	Artemisia tridentata ssp. tridentata
De also Massatain Cambal Oak Missad	Artemisia tridentata ssp. wyomingensis
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	Artemisia tridentata
Rocky Mountain Lower Montane-Foothill	Artemisia nova
Shrubland	Artemisia nova Artemisia tridentata
Sinuulanu	
Western Great Plains Floodplain Systems	Artemisia frigida Artemisia cana ssp. cana
	-
Western Great Plains Sand Prairie	Artemisia cana ssp. cana
Wyoming Basins Dwarf Sagebrush	Artemisia arbuscula ssp. longiloba
Shrubland and Steppe	Artemisia nova
	Artemisia tridentata ssp. wyomingensis
Artemicia tridentata con vacevana	Artemisia tripartita ssp. rupicola
Artemisia tridentata ssp. vaseyana Shrubland Alliance (EVT only)	Artemisia tridentata ssp. vaseyana
Quercus gambelii Shrubland Alliance (EVT	Artemisia tridentata
	Artemisia triaeniaia
only)	

Accuracy and Appropriate Use of LANDFIRE Datasets

Because of concerns over the thematic accuracy of individual classes mapped by LANDFIRE, all ecological systems listed in Table 4 will be merged into one value that represents the sagebrush base layer. With all ecological systems aggregated, the combined accuracy of the sagebrush base layer (EVT) will be much greater than if all categories were treated separately.

LANDFIRE performed the original accuracy assessment of its EVT product on a map zone basis. There are 20 LANDFIRE map zones that cover the historical range of sage-grouse as defined by Schroeder (2004). (See Attachment B, User and Producer Accuracies for Aggregated Ecological Systems within LANDFIRE Map Zones.) The aggregated sagebrush base layer for monitoring had user accuracies ranging from 57.1% to 85.7% and producer accuracies ranging from 56.7% to 100%.

LANDFIRE EVT data are not designed to be used at a local level. In reports of the percent sagebrush statistic for the various reporting units (Measure 1a), the uncertainty of the percent sagebrush will increase as the size of the reporting unit gets smaller. LANDFIRE data should never be used at the 30m pixel level (900m² resolution of raster data) for any reporting. The smallest geographic extent for using the data to determine percent sagebrush is at the PAC level; for the smallest PACs, the initial percent sagebrush estimate will have greater uncertainties compared with the much larger PACs.

Agricultural Adjustments for the Sagebrush Base Layer

The dataset for the geographic extent of agricultural lands will come from the National Agricultural Statistics Service (NASS) Cropland Data Layer (CDL)

(http://www.nass.usda.gov/research/Cropland/Release/index.htm). CDL data are generated annually, with estimated producer accuracies for "large area row crops ranging from the mid 80% to mid-90%," depending on the state

(http://www.nass.usda.gov/research/Cropland/sarsfaqs2.htm#Section3_18.0). Specific information on accuracy may be found on the NASS metadata website (http://www.nass.usda.gov/research/Cropland/metadata/meta.htm). CDL provided the only dataset that matches the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in this monitoring framework and represents the best available agricultural lands mapping product.

The CDL data contain both agricultural classes and nonagricultural classes. For this effort, and in the baseline environmental report (Manier et al. 2013), nonagricultural classes were removed from the original dataset. The excluded classes are:

Barren (65 & 131), Deciduous Forest (141), Developed/High Intensity (124), Developed/Low Intensity (122), Developed/Med Intensity (123), Developed/Open Space (121), Evergreen Forest (142), Grassland Herbaceous (171), Herbaceous Wetlands (195), Mixed Forest (143), Open

Water (83 & 111), Other Hay/Non Alfalfa (37), Pasture/Hay (181), Pasture/Grass (62), Perennial Ice/Snow (112), Shrubland (64 & 152), Woody Wetlands (190).

The rule set for adjusting the sagebrush base layer for agricultural lands (and for updating the base layer for agricultural lands in the future) is that once an area is classified as agriculture in any year of the CDL, those pixels will remain out of the sagebrush base layer even if a new version of the CDL classifies that pixel as one of the nonagricultural classes listed above. The assumption is that even though individual pixels may be classified as a nonagricultural class in any given year, the pixel has not necessarily been restored to a natural sagebrush community that would be included in Table 4. A further assumption is that once an area has moved into agricultural use, it is unlikely that the area would be restored to sagebrush. Should that occur, however, the method and criteria for adding pixels back into the sagebrush base layer would follow those found in the sagebrush restoration monitoring section of this monitoring framework (see Section I.B.1.b., Monitoring Sagebrush Availability).

Urban Adjustments for the Sagebrush Base Layer

The National Land Cover Database (NLCD) (Fry et al. 2011) includes a percent imperviousness dataset that was selected as the best available dataset to be used for urban adjustments and monitoring. These data are generated on a 5-year cycle and are specifically designed to support monitoring efforts. Other datasets were evaluated and lacked the spatial specificity that was captured in the NLCD product. Any new impervious pixel in NLCD will be removed from the sagebrush base layer through the monitoring process. Although the impervious surface layer includes a number of impervious pixels outside of urban areas, this is acceptable for the adjustment and monitoring for two reasons. First, an evaluation of national urban area datasets did not reveal a layer that could be confidently used in conjunction with the NLCD product to screen impervious pixels outside of urban zones. This is because unincorporated urban areas were not being included, thus leaving large chunks of urban pixels unaccounted for in this rule set. Second, experimentation with setting a threshold on the percent imperviousness layer that would isolate rural features proved to be unsuccessful. No combination of values could be identified that would result in the consistent ability to limit impervious pixels outside urban areas. Therefore, to ensure consistency in the monitoring estimates, all impervious pixels will be used.

Fire Adjustments for the Sagebrush Base Layer

Two datasets were selected for performing fire adjustments and updates: GeoMac fire perimeters and Monitoring Trends in Burn Severity (MTBS). An existing data standard in the BLM requires that all fires of more than 10 acres are to be reported to GeoMac; therefore, there will be many small fires of less than 10 acres that will not be accounted for in the adjustment and monitoring attributable to fire. Using fire perimeters from GeoMac, all sagebrush pixels falling

within the perimeter of fires less than 1,000 acres will be used to adjust and monitor the sagebrush base layer.

For fires greater than 1,000 acres, MTBS was selected as a means to account for unburned sagebrush islands during the update process of the sagebrush base layer. The MTBS program (http://www.mtbs.gov) is an ongoing, multiyear project to map fire severity and fire perimeters consistently across the United States. One of the burn severity classes within MTBS is an unburned to low-severity class. This burn severity class will be used to represent unburned islands of sagebrush within the fire perimeter for the sagebrush base layer. Areas within the other severity classes within the fire perimeter will be removed from the base sagebrush layer during the update process. Not all wildfires, however, have the same impacts on the recovery of sagebrush habitat, depending largely on soil moisture and temperature regimes. For example, cooler, moister sagebrush habitat has a higher potential for recovery or, if needed, restoration than does the warmer, dryer sagebrush habitat. These cooler, moister areas will likely be detected as sagebrush in future updates to LANDFIRE.

Conifer Encroachment Adjustment for the Sagebrush Base Layer

Conifer encroachment into sagebrush vegetation reduces the spatial extent of sage-grouse habitat (Davies et al. 2011, Baruch-Mordo et al. 2013). Conifer species that show propensity for encroaching into sagebrush vegetation resulting in sage-grouse habitat loss include various juniper species, such as Utah juniper (*Juniperus osteosperma*), western juniper (*Juniperus occidentalis*), Rocky Mountain juniper (*Juniperus scopulorum*), pinyon species, including singleleaf pinyon (*Pinus monophylla*) and pinyon pine (*Pinus edulis*), ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), and Douglas fir (*Pseudotsuga menziesii*) (Gruell et al. 1986, Grove et al. 2005, Davies et al. 2011).

A rule set for conifer encroachment was developed to adjust the sagebrush base layer. To capture the geographic extent of sagebrush that is likely to experience conifer encroachment, ecological systems within LANDFIRE EVT version 1.2 (NatureServe 2011) were identified if they had the capability of supporting both the conifer species (listed above) and sagebrush vegetation. Those ecological systems were deemed to be the plant communities with conifers most likely to encroach into sagebrush vegetation. (See Table 5, Ecological systems with conifers most likely to encroach into sagebrush vegetation.) Sagebrush vegetation was defined as including sagebrush species or subspecies that provide habitat for the Greater Sage-Grouse and that are included in the HAF. (See Attachment C, Sagebrush Species and Subspecies Included in the Selection Criteria for Building the EVT and BpS Layers.) An adjacency analysis was conducted to identify all sagebrush pixels that were directly adjacent to these conifer ecological systems, and these pixels were removed from the sagebrush base layer.

Table 5. Ecological systems with conifers most likely to encroach into sagebrush vegetation.

Table 5. Ecological systems with conifers most like		
	Coniferous Species and Sagebrush Vegetation that	
EVT Ecological Systems	the Ecological System has the Capability of	
	Producing	
Colorado Plateau Pinyon-Juniper Woodland	Pinus edulis	
	Juniperus osteosperma	
	Artemisia tridentata	
	Artemisia arbuscula	
	Artemisia nova	
	Artemisia tridentata ssp. tridentata	
	Artemisia tridentata ssp. wyomingensis	
	Artemisia tridentata ssp. vaseyana	
	Artemisia bigelovii	
	Artemisia pygmaea	
Columbia Plateau Western Juniper Woodland and	Juniperus occidentalis	
Savanna	Pinus ponderosa	
	Artemisia tridentata	
	Artemisia arbuscula	
	Artemisia rigida	
	Artemisia tridentata ssp. vaseyana	
East Cascades Oak-Ponderosa Pine Forest and	Pinus ponderosa	
Woodland	Pseudotsuga menziesii	
Woodiana	Artemisia tridentata	
	Artemisia nova	
Great Basin Pinyon-Juniper Woodland	Pinus monophylla	
Great Basin Finyon-Jumper Woodiand	Juniperus osteosperma	
	Artemisia arbuscula	
	Artemisia arbuscula Artemisia nova	
	Artemisia tridentata	
North and Dooley Mountain Dandanasa Dina	Artemisia tridentata ssp. vaseyana	
Northern Rocky Mountain Ponderosa Pine	Pinus ponderosa	
Woodland and Savanna	Artemisia tridentata	
	Artemisia arbuscula	
	Artemisia tridentata ssp. vaseyana	
Rocky Mountain Foothill Limber Pine-Juniper	Juniperus osteosperma	
Woodland	Juniperus scopulorum	
	Artemisia nova	
	Artemisia tridentata	
Rocky Mountain Poor-Site Lodgepole Pine Forest	Pinus contorta	
	Pseudotsuga menziesii	
	Pinus ponderosa	
	Artemisia tridentata	
Southern Rocky Mountain Pinyon-Juniper	Pinus edulis	
Woodland	Juniperus monosperma	
	Artemisia bigelovii	
	Artemisia tridentata	
	Artemisia tridentata ssp. wyomingensis	
	Artemisia tridentata ssp. vaseyana	
Southern Rocky Mountain Ponderosa Pine	Pinus ponderosa	
Woodland	Pseudotsuga menziesii	

Pinus edulis
Pinus contorta
Juniperus spp.
Artemisia nova
Artemisia tridentata
Artemisia arbuscula
Artemisia tridentata ssp. vaseyana

Invasive Annual Grasses Adjustments for the Sagebrush Base Layer

There are no invasive species datasets from 2010 to the present (beyond the LANDFIRE data) that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in the determination of the sagebrush base layer. For a description of how invasive species land cover will be incorporated in the sagebrush base layer in the future, see Section I.B.1.b., Monitoring Sagebrush Availability.

Sagebrush Restoration Adjustments for the Sagebrush Base Layer

There are no datasets from 2010 to the present that could provide additions to the sagebrush base layer from restoration treatments that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated); therefore, no adjustments were made to the sagebrush base layer calculated from the LANDFIRE EVT (version 1.2) attributable to restoration activities since 2010. Successful restoration treatments before 2010 are assumed to have been captured in the LANDFIRE refresh.

b. Monitoring Sagebrush Availability

Monitoring Sagebrush Availability

Sagebrush availability will be updated annually by incorporating changes to the sagebrush base layer attributable to agriculture, urbanization, and wildfire. The monitoring schedule for the existing sagebrush base layer updates is as follows:

2010 Existing Sagebrush Base Layer = [Sagebrush EVT] minus [2006 Imperviousness Layer] minus [2009 and 2010 CDL] minus [2009/10 GeoMac Fires that are less than 1,000 acres] minus [2009/10 MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter] minus [Conifer Encroachment Layer]

2012 Existing Sagebrush Update = [2010 Existing Sagebrush Base Layer] minus [2011 Imperviousness Layer] minus [2011 and 2012 CDL] minus [2011/12 GeoMac Fires < 1,000 acres] minus [2011/12 MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter]

Monitoring Existing Sagebrush post 2012 = [Previous Existing Sagebrush Update Layer] minus [Imperviousness Layer (if new data are available)] minus [Next 2 years of CDL] minus [Next 2 years of GeoMac Fires < 1,000 acres] minus [Next 2 years of MTBS Fires that are greater than

1,000 acres, excluding unburned sagebrush islands within the perimeter] plus [restoration/monitoring data provided by the field]

Monitoring Sagebrush Restoration

Restoration after fire, after agricultural conversion, after seedings of introduced grasses, or after treatments of pinyon pine and/or juniper are examples of updates to the sagebrush base layer that can add sagebrush vegetation back into sagebrush availability in the landscape. When restoration has been determined to be successful through rangewide, consistent, interagency fine- and site-scale monitoring, the polygonal data will be used to add sagebrush pixels back into the broadand mid-scale sagebrush base layer.

Measure 1b: Context for Monitoring the Amount of Sagebrush in a Geographic Area of Interest

Measure 1b describes the amount of sagebrush on the landscape of interest compared with the amount of sagebrush the landscape of interest could ecologically support. Areas with the potential to support sagebrush were derived from the BpS data layer that describes sagebrush pre-EuroAmerican settlement (v1.2 of LANDFIRE).

The identification and spatial locations of natural plant communities (vegetation) that are believed to have existed on the landscape (BpS) were constructed based on an approximation of the historical (pre-EuroAmerican settlement) disturbance regime and how the historical disturbance regime operated on the current biophysical environment. BpS is composed of map units that are based on NatureServe (2011) terrestrial ecological systems classification.

The ecological systems within BpS used for this monitoring framework are those ecological systems that are capable of supporting sagebrush vegetation and of providing seasonal habitat for sage-grouse (Table 4). Ecological systems selected included sagebrush species or subspecies that are included in the HAF and listed in Attachment C.

The BpS layer does not have an associated accuracy assessment, given the lack of any reference data. Visual inspection of the BpS data, however, reveals inconsistencies in the labeling of pixels among LANDFIRE map zones. The reason for these inconsistencies is that the rule sets used to map a given ecological system will vary among map zones based on different physical, biological, disturbance, and atmospheric regimes of the region. These variances can result in artificial edges in the map. Metrics will be calculated, however, at broad spatial scales using BpS potential vegetation type, not small groupings or individual pixels. Therefore, the magnitude of these observable errors in the BpS layer will be minor compared with the size of the reporting units. Since BpS will be used to identify broad landscape patterns of dominant vegetation, these inconsistencies will have only a minor impact on the percent sagebrush availability calculation. As with the LANDFIRE EVT, LANDFIRE BpS data are not designed to be used at a local level. LANDFIRE data should never be used at the 30m pixel level for reporting.

In conclusion, sagebrush availability data will be used to inform effectiveness monitoring and initiate adaptive management actions as necessary. The 2010 estimate of sagebrush availability will serve as the base year, and an updated estimate for 2012 will be reported in 2014 after all datasets become available. The 2012 estimate will capture changes attributable to wildfire, agriculture, and urban development. Subsequent updates will always include new fire and agricultural data and new urban data when available. Restoration data that meet the criteria for adding sagebrush areas back into the sagebrush base layer will be factored in as data allow. Given data availability, there will be a 2-year lag (approximately) between when the estimate is generated and when the data used for the estimate become available (e.g., the 2014 sagebrush availability will be included in the 2016 estimate).

Future Plans

Geospatial data used to generate the sagebrush base layer will be available through the BLM's EGIS web portal and geospatial gateway or through the authoritative data source. Legacy datasets will be preserved so that trends may be calculated. Additionally, accuracy assessment data for all source datasets will be provided on the portal either spatially, where applicable, or through the metadata. Accuracy assessment information was deemed vital to help users understand the limitation of the sagebrush estimates; it will be summarized spatially by map zone and will be included in the portal.

LANDFIRE plans to begin a remapping effort in 2015. This remapping has the potential to improve the overall quality of data products greatly, primarily through the use of higher-quality remote sensing datasets. Additionally, the BLM and the Multi-Resolution Land Characteristics Consortium (MRLC) are working to improve the accuracy of vegetation map products for broadand mid-scale analyses through the Grass/Shrub mapping effort. The Grass/Shrub mapping effort applies the Wyoming multiscale sagebrush habitat methodology (Homer et al. 2009) to depict spatially the fractional percent cover estimates for five components rangewide and West-wide. These five components are percent cover of sagebrush vegetation, percent bare ground, percent herbaceous vegetation (grass and forbs combined), annual vegetation, and percent shrubs. A benefit of the design of these fractional cover maps is that they facilitate monitoring "within" class variation (e.g., examination of declining trend in sagebrush cover for individual pixels). This "within" class variation can serve as one indicator of sagebrush quality that cannot be derived from LANDFIRE's EVT information. The Grass/Shrub mapping effort is not a substitute for fine-scale monitoring but will leverage fine-scale data to support the validation of the mapping products. An evaluation will be conducted to determine if either dataset is of great enough quality to warrant replacing the existing sagebrush layers. At the earliest, this evaluation will occur in 2018 or 2019, depending on data availability.

B.2. Habitat Degradation Monitoring (Measure 2)

The measure of habitat degradation will be calculated by combining the footprints of threats identified in Table 2. The footprint is defined as the direct area of influence of "active" energy and infrastructure; it is used as a surrogate for human activity. Although these analyses will try to summarize results at the aforementioned meaningful geographic areas of interest, some may be too small to report the metrics appropriately and may be combined (smaller populations, PACs within a population, etc.). Data sources for each threat are found in Table 6, Geospatial data sources for habitat degradation. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure, are detailed below. All datasets will be updated annually to monitor broad- and midscale year-to-year changes and to calculate trends in habitat degradation to inform adaptive management. A 5-year summary report will be provided to the USFWS.

a. Habitat Degradation Datasets and Assumptions

Energy (oil and gas wells and development facilities)

This dataset will compile information from three oil and gas databases: the proprietary IHS Enerdeq database, the BLM Automated Fluid Minerals Support System (AFMSS) database, and the proprietary Platts (a McGraw-Hill Financial Company) GIS Custom Data (hereafter, Platts) database of power plants. Point data from wells active within the last 10 years from IHS and producing wells from AFMSS will be considered as a 5-acre (2.0ha) direct area of influence centered on the well point, as recommended by the BLM WO-300 (Minerals and Realty Management). Plugged and abandoned wells will be removed if the date of well abandonment was before the first day of the reporting year (i.e., for the 2015 reporting year, a well must have been plugged and abandoned by 12/31/2014 to be removed). Platts oil and gas power plants data (subset to operational power plants) will also be included as a 5-acre (2.0ha) direct area of influence.

Additional Measure: Reclaimed Energy-related Degradation. This dataset will include those wells that have been plugged and abandoned. This measure thereby attempts to measure energy-related degradation that has been reclaimed but not necessarily fully restored to sage-grouse habitat. This measure will establish a baseline by using wells that have been plugged and abandoned within the last 10 years from the IHS and AFMSS datasets. Time lags for lek attendance in response to infrastructure have been documented to be delayed 2–10 years from energy development activities (Harju et al. 2010). Reclamation actions may require 2 or more years from the Final Abandonment Notice. Sagebrush seedling establishment may take 6 or more years from the point of seeding, depending on such variables as annual precipitation, annual temperature, and soil type and depth (Pyke 2011). This 10-year period is conservative and assumes some level of habitat improvement 10 years after plugging. Research by Hemstrom et al. (2002), however,

proposes an even longer period—more than 100 years—for recovery of sagebrush habitats, even with active restoration approaches. Direct area of influence will be considered 3 acres (1.2ha) (J. Perry, personal communication, February 12, 2014). This additional layer/measure could be used at the broad and mid scale to identify areas where sagebrush habitat and/or potential sagebrush habitat is likely still degraded. This layer/measure could also be used where further investigation at the fine or site scale would be warranted to: 1) quantify the level of reclamation already conducted, and 2) evaluate the amount of restoration still required for sagebrush habitat recovery. At a particular level (e.g., population, PACs), these areas and the reclamation efforts/success could be used to inform reclamation standards associated with future developments. Once these areas have transitioned from reclamation standards to meeting *restoration* standards, they can be added back into the sagebrush availability layer using the same methodology as described for adding restoration treatment areas lost to wildfire and agriculture conversion (see Monitoring Sagebrush Restoration in Section I.B.1.b., Monitoring Sagebrush Availability). This dataset will be updated annually from the IHS dataset.

Energy (coal mines)

Currently, there is no comprehensive dataset available that identifies the footprint of active coal mining across all jurisdictions. Therefore, point and polygon datasets will be used each year to identify coal mining locations. Data sources will be identified and evaluated annually and will include at a minimum: BLM coal lease polygons, U.S. Energy Information Administration mine occurrence points, U.S. Office of Surface Mining Reclamation and Enforcement coal mining permit polygons (as available), and U.S. Geological Survey (USGS) Mineral Resources Data System mine occurrence points. These data will inform where active coal mining may be occurring. Additionally, coal power plant data from Platts power plants database (subset to operational power plants) will be included. Aerial imagery will then be used to digitize manually the active coal mining and coal power plants surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from Esri and/or Google will be used to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active coal mine and power plant direct area of influence. Coal mine location data source and imagery date will be documented for each digitized coal polygon at the time of creation. Subsurface facility locations (polygon or point location as available) will also be collected if available, included in density calculations, and added to the active surface activity layer as appropriate (if an actual direct area of influence can be located).

Energy (wind energy facilities)

This dataset will be a subset of the Federal Aviation Administration (FAA) Digital Obstacles point file. Points where "Type_" = "WINDMILL" will be included. Direct area of influence of these point features will be measured by converting to a polygon dataset as a direct area of

influence of 3 acres (1.2ha) centered on each tower point. See the BLM's "Wind Energy Development Programmatic Environmental Impact Statement" (BLM 2005). Additionally, Platts power plants database will be used for transformer stations associated with wind energy sites (subset to operational power plants), also with a 3-acre (1.2ha) direct area of influence.

Energy (solar energy facilities)

This dataset will include solar plants as compiled with the Platts power plants database (subset to operational power plants). This database includes an attribute that indicates the operational capacity of each solar power plant. Total capacity at the power plant was based on ratings of the in-service unit(s), in megawatts. Direct area of influence polygons will be centered over each point feature representing 7.3ac (3.0ha) per megawatt of the stated operational capacity, per the report of the National Renewable Energy Laboratory (NREL), "Land-Use Requirements for Solar Power Plants in the United States" (Ong et al. 2013).

Energy (geothermal energy facilities)

This dataset will include geothermal wells in existence or under construction as compiled with the IHS wells database and power plants as compiled with the Platts database (subset to operational power plants). Direct area of influence of these point features will be measured by converting to a polygon dataset of 3 acres (1.2ha) centered on each well or power plant point.

Mining (active developments; locatable, leasable, saleable)

This dataset will include active locatable mining locations as compiled with the proprietary InfoMine database. Aerial imagery will then be used to digitize manually the active mining surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from Esri and/or Google will be used to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active mine direct area of influence. Mine location data source and imagery date will be documented for each digitized polygon at the time of creation. Currently, there are no known compressive databases available for leasable or saleable mining sites beyond coal mines. Other data sources will be evaluated and used as they are identified or as they become available. Point data may be converted to polygons to represent direct area of influence unless actual surface disturbance is available.

Infrastructure (roads)

This dataset will be compiled from the proprietary Esri StreetMap Premium for ArcGIS. Dataset features that will be used are: Interstate Highways, Major Roads, and Surface Streets to capture most paved and "crowned and ditched" roads while not including "two-track" and 4-wheel-drive routes. These minor roads, while not included in the broad- and mid-scale monitoring, may support a volume of traffic that can have deleterious effects on sage-grouse leks. It may be

appropriate to consider the frequency and type of use of roads in a NEPA analysis for a proposed project. This fine- and site-scale analysis will require more site-specific data than is identified in this monitoring framework. The direct area of influence for roads will be represented by 240.2ft, 84.0ft, and 40.7ft (73.2m, 25.6m, and 12.4m) total widths centered on the line feature for Interstate Highways, Major Roads, and Surface Streets, respectively (Knick et al. 2011). The most current dataset will be used for each monitoring update. *Note: This is a related but different dataset than what was used in BER (Manier et al. 2013). Individual BLM/USFS planning units may use different road layers for fine- and site-scale monitoring.*

Infrastructure (railroads)

This dataset will be a compilation from the Federal Railroad Administration Rail Lines of the USA dataset. Non-abandoned rail lines will be used; abandoned rail lines will not be used. The direct are of influence for railroads will be represented by a 30.8ft (9.4m) total width (Knick et al. 2011) centered on the non-abandoned railroad line feature.

Infrastructure (power lines)

This line dataset will be derived from the proprietary Platts transmission lines database. Linear features in the dataset attributed as "buried" will be removed from the disturbance calculation. Only "In Service" lines will be used; "Proposed" lines will not be used. Direct area of influence will be determined by the kV designation: 1–199 kV (100ft/30.5m), 200–399 kV (150ft/45.7m), 400–699 kV (200ft/61.0m), and 700-or greater kV (250ft/76.2m) based on average right-of-way and structure widths, according to BLM WO-300 (Minerals and Realty Management).

Infrastructure (communication towers)

This point dataset will be compiled from the Federal Communications Commission (FCC) communication towers point file; all duplicate points will be removed. It will be converted to a polygon dataset by using a direct area of influence of 2.5 acres (1.0ha) centered on each communication tower point (Knick et al. 2011).

Infrastructure (other vertical structures)

This point dataset will be compiled from the FAA's Digital Obstacles point file. Points where "Type_" = "WINDMILL" will be removed. Duplicate points from the FCC communication towers point file will be removed. Remaining features will be converted to a polygon dataset using a direct area of influence of 2.5 acres (1.0ha) centered on each vertical structure point (Knick et al. 2011).

Other Developed Rights-of-Way

Currently, no additional data sources for other rights-of-way have been identified; roads, power lines, railroads, pipelines, and other known linear features are represented in the categories

described above. The newly purchased IHS data do contain pipeline information; however, this database does not currently distinguish between above-ground and underground pipelines. If additional features representing human activities are identified, they will be added to monitoring reports using similar assumptions to those used with the threats described above.

b. Habitat Degradation Threat Combination and Calculation

The threats targeted for measuring human activity (Table 2) will be converted to direct area of influence polygons as described for each threat above. These threat polygon layers will be combined and features dissolved to create one overall polygon layer representing footprints of active human activity in the range of sage-grouse. Individual datasets, however, will be preserved to indicate which types of threats may be contributing to overall habitat degradation.

This measure has been divided into three submeasures to describe habitat degradation on the landscape. Percentages will be calculated as follows:

Measure 2a. Footprint by geographic area of interest: Divide area of the active/direct footprint by the total area of the geographic area of interest (% disturbance in geographic area of interest).

Measure 2b. Active/direct footprint by historical sagebrush potential: Divide area of the active footprint that coincides with areas with historical sagebrush potential (BpS calculation from habitat availability) within a given geographic area of interest by the total area with sagebrush potential within the geographic area of interest (% disturbance on potential historical sagebrush in geographic area of interest).

Measure 2c. Active/direct footprint by current sagebrush: Divide area of the active footprint that coincides with areas of existing sagebrush (EVT calculation from habitat availability) within a given geographic area of interest by the total area that is current sagebrush within the geographic area of interest (% disturbance on current sagebrush in geographic area of interest).

B.3. Energy and Mining Density (Measure 3)

The measure of density of energy and mining will be calculated by combining the locations of energy and mining threats identified in Table 2. This measure will provide an estimate of the intensity of human activity or the intensity of habitat degradation. The number of energy facilities and mining locations will be summed and divided by the area of meaningful geographic areas of interest to calculate density of these activities. Data sources for each threat are found in Table 6. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure, are detailed

below. All datasets will be updated annually to monitor broad- and mid-scale year-to-year changes and 5-year (or longer) trends in habitat degradation.

Table 6. Geospatial data sources for habitat degradation (Measure 2).

Daniel dan T	Calandan	Deta Granna	Direct Area of	Area
Degradation Type	Subcategory	Data Source	Influence	Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO- 300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO- 300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/ Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO- 300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO- 300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO- 300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
,	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO- 300
•	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO- 300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO- 300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO- 300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO- 300

a. Energy and Mining Density Datasets and Assumptions

Energy (oil and gas wells and development facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (coal mines)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (wind energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (solar energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (geothermal energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Mining (active developments; locatable, leasable, saleable)

(See Section I.B.2., Habitat Degradation Monitoring.)

b. Energy and Mining Density Threat Combination and Calculation

Datasets for energy and mining will be collected in two primary forms: point locations (e.g., wells) and polygon areas (e.g., surface coal mining). The following rule set will be used to calculate density for meaningful geographic areas of interest including standard grids and per polygon:

- 1) Point locations will be preserved; no additional points will be removed beyond the methodology described above. Energy facilities in close proximity (an oil well close to a wind tower) will be retained.
- 2) Polygons will not be merged, or features further dissolved. Thus, overlapping facilities will be retained, such that each individual threat will be a separate polygon data input for the density calculation.
- 3) The analysis unit (polygon or 640-acre section in a grid) will be the basis for counting the number of mining or energy facilities per unit area. Within the analysis unit, all point features will be summed, and any individual polygons will be counted as one (e.g., a coal mine will be counted as one facility within population). Where polygon features overlap multiple units (polygons or pixels), the facility will be counted as one in each unit where the polygon occurs (e.g., a polygon crossing multiple 640-acre

- sections would be counted as one in each 640-acre section for a density per 640-acre-section calculation).
- 4) In methodologies with different-sized units (e.g., MZs, populations, etc.) raw facility counts will be converted to densities by dividing the raw facility counts by the total area of the unit. Typically this will be measured as facilities per 640 acres.
- 5) For uniform grids, raw facility counts will be reported. Typically this number will also be converted to facilities per 640 acres.
- 6) Reporting may include summaries beyond the simple ones above. Zonal statistics may be used to smooth smaller grids to help display and convey information about areas within meaningful geographic areas of interest that have high levels of energy and/or mining activity.
- 7) Additional statistics for each defined unit may also include adjusting the area to include only the area with the historical potential for sagebrush (BpS) or areas currently sagebrush (EVT).

Individual datasets and threat combination datasets for habitat degradation will be available through the BLM's EGIS web portal and geospatial gateway. Legacy datasets will be preserved so that trends may be calculated.

C. Population (Demographics) Monitoring

State wildlife management agencies are responsible for monitoring sage-grouse populations within their respective states. WAFWA will coordinate this collection of annual population data by state agencies. These data will be made available to the BLM according to the terms of the forthcoming Greater Sage-Grouse Population Monitoring Memorandum of Understanding (MOU) (2014) between WAFWA and the BLM. The MOU outlines a process, timeline, and responsibilities for regular data sharing of sage-grouse population and/or habitat information for the purposes of implementing sage-grouse LUPs/amendments and subsequent effectiveness monitoring. Population areas were refined from the "Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report" (COT 2013) by individual state wildlife agencies to create a consistent naming nomenclature for future data analyses. These population data will be used for analysis at the applicable scale to supplement habitat effectiveness monitoring of management actions and to inform the adaptive management responses.

D. Effectiveness Monitoring

Effectiveness monitoring will provide the data needed to evaluate BLM and USFS actions toward reaching the objective of the national planning strategy (BLM IM 2012-044)—to conserve sage-grouse populations and their habitat—and the objectives for the land use planning

area. Effectiveness monitoring methods described here will encompass multiple larger scales, from areas as large as the WAFWA MZ to the scale of this LUP. Effectiveness data used for these larger-scale evaluations will include all lands in the area of interest, regardless of surface ownership/management, and will help inform where finer-scale evaluations are needed, such as population areas smaller than an LUP or PACs within an LUP (described in Section II, Fine and Site Scales). Data will also include the trend of disturbance within these areas of interest to inform the need to initiate adaptive management responses as described in the land use plan.

Effectiveness monitoring reported for these larger areas provides the context to conduct effectiveness monitoring at finer scales. This approach also helps focus scarce resources to areas experiencing habitat loss, degradation, or population declines, without excluding the possibility of concurrent, finer-scale evaluations as needed where habitat or population anomalies have been identified through some other means.

To determine the effectiveness of the sage-grouse national planning strategy, the BLM and the USFS will evaluate the answers to the following questions and prepare a broad- and mid-scale effectiveness report:

- 1) Sagebrush Availability and Condition:
 - a. What is the amount of sagebrush availability and the change in the amount and condition of sagebrush?
 - b. What is the existing amount of sagebrush on the landscape and the change in the amount relative to the pre-EuroAmerican historical distribution of sagebrush (BpS)?
 - c. What is the trend and condition of the indicators describing sagebrush characteristics important to sage-grouse?
- 2) Habitat Degradation and Intensity of Activities:
 - a. What is the amount of habitat degradation and the change in that amount?
 - b. What is the intensity of activities and the change in the intensity?
 - c. What is the amount of reclaimed energy-related degradation and the change in the amount?
- 3) What is the population estimation of sage-grouse and the change in the population estimation?
- 4) How are the BLM and the USFS contributing to changes in the amount of sagebrush?
- 5) How are the BLM and the USFS contributing to disturbance?

The compilation of broad- and mid-scale data (and population trends as available) into an effectiveness monitoring report will occur on a 5-year reporting schedule (see Attachment A), which may be accelerated to respond to critical emerging issues (in consultation with the USFWS and state wildlife agencies). In addition, effectiveness monitoring results will be used to identify emerging issues and research needs and inform the BLM and the USFS adaptive

management strategy (see the adaptive management section of this Environmental Impact Statement).

To determine the effectiveness of the sage-grouse objectives of the land use plan, the BLM and the USFS will evaluate the answers to the following questions and prepare a plan effectiveness report:

- 1) Is this plan meeting the sage-grouse habitat objectives?
- 2) Are sage-grouse areas within the LUP meeting, or making progress toward meeting, land health standards, including the Special Status Species/wildlife habitat standard?
- 3) Is the plan meeting the disturbance objective(s) within sage-grouse areas?
- 4) Are the sage-grouse populations within this plan boundary and within the sage-grouse areas increasing, stable, or declining?

The effectiveness monitoring report for this LUP will occur on a 5-year reporting schedule (see Attachment A) or more often if habitat or population anomalies indicate the need for an evaluation to facilitate adaptive management or respond to critical emerging issues. Data will be made available through the BLM's EGIS web portal and the geospatial gateway.

Methods

At the broad and mid scales (PACs and above) the BLM and the USFS will summarize the vegetation, disturbance, and (when available) population data. Although the analysis will try to summarize results for PACs within each sage-grouse population, some populations may be too small to report the metrics appropriately and may need to be combined to provide an estimate with an acceptable level of accuracy. Otherwise, they will be flagged for more intensive monitoring by the appropriate landowner or agency. The BLM and the USFS will then analyze monitoring data to detect the trend in the amount of sagebrush; the condition of the vegetation in the sage-grouse areas (MacKinnon et al. 2011); the trend in the amount of disturbance; the change in disturbed areas owing to successful restoration; and the amount of new disturbance the BLM and/or the USFS has permitted. These data could be supplemented with population data (when available) to inform an understanding of the correlation between habitat and PACs within a population. This overall effectiveness evaluation must consider the lag effect response of populations to habitat changes (Garton et al. 2011).

Calculating Question 1, National Planning Strategy Effectiveness: The amount of sagebrush available in the large area of interest will use the information from Measure 1a (I.B.1., Sagebrush Availability) and calculate the change from the 2012 baseline to the end date of the reporting period. To calculate the change in the amount of sagebrush on the landscape to compare with the historical areas with potential to support sagebrush, the information from Measure 1b (I.B.1., Sagebrush Availability) will be used. To calculate the trend in the condition of sagebrush at the mid scale, three sources of data will be used: the BLM's Grass/Shrub mapping effort (Future Plans in Section I.B.1., Sagebrush Availability); the results from the calculation of the landscape

indicators, such as patch size (described below); and the BLM's Landscape Monitoring Framework (LMF) and sage-grouse intensification effort (also described below). The LMF and sage-grouse intensification effort data are collected in a statistical sampling framework that allows calculation of indicator values at multiple scales.

Beyond the importance of sagebrush availability to sage-grouse, the mix of sagebrush patches on the landscape at the broad and mid scale provides the life requisite of space for sage-grouse dispersal needs (see the HAF). The configuration of sagebrush habitat patches and the land cover or land use between the habitat patches at the broad and mid scales also defines suitability. There are three significant habitat indicators that influence habitat use, dispersal, and movement across populations: the size and number of habitat patches, the connectivity of habitat patches (linkage areas), and habitat fragmentation (scope of unsuitable and non-habitats between habitat patches). The most appropriate commercial software to measure patch dynamics, connectivity, and fragmentation at the broad and mid scales will be used, along with the same data layers derived for sagebrush availability.

The BLM initiated the LMF in 2011 in cooperation with the Natural Resources Conservation Service (NRCS). The objective of the LMF effort is to provide unbiased estimates of vegetation and soil condition and trend using a statistically balanced sample design across BLM lands. Recognizing that sage-grouse populations are more resilient where the sagebrush plant community has certain characteristics unique to a particular life stage of sage-grouse (Knick and Connelly 2011, Stiver et al. in press), a group of sage-grouse habitat and sagebrush plant community subject matter experts identified those vegetation indicators collected at LMF sampling points that inform sage-grouse habitat needs. The experts represented the Agricultural Research Service, BLM, NRCS, USFWS, WAFWA, state wildlife agencies, and academia. The common indicators identified include: species composition, foliar cover, height of the tallest sagebrush and herbaceous plant, intercanopy gap, percent of invasive species, sagebrush shape, and bare ground. To increase the precision of estimates of sagebrush conditions within the range of sage-grouse, additional plot locations in occupied sage-grouse habitat (Sage-Grouse Intensification) were added in 2013. The common indicators are also collected on sampling locations in the NRCS National Resources Inventory Rangeland Resource Assessment (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/nri/?&cid=stelprdb10416 20).

The sage-grouse intensification baseline data will be collected over a 5-year period, and an annual sage-grouse intensification report will be prepared describing the status of the indicators. Beginning in year 6, the annual status report will be accompanied with a trend report, which will be available on an annual basis thereafter, contingent on continuation of the current monitoring budget. This information, in combination with the Grass/Shrub mapping information, the midscale habitat suitability indicator measures, and the sagebrush availability information will be used to answer Question 1 of the National Planning Strategy Effectiveness Report.

Calculating Question 2, National Planning Strategy Effectiveness: Evaluations of the amount of habitat degradation and the intensity of the activities in the area of interest will use the information from Measure 2 (Section I.B.2., Habitat Degradation Monitoring) and Measure 3 (Section I.B.3., Energy and Mining Density). The field office will collect data on the amount of reclaimed energy-related degradation on plugged and abandoned and oil/gas well sites. The data are expected to demonstrate that the reclaimed sites have yet to meet the habitat restoration objectives for sage-grouse habitat. This information, in combination with the amount of habitat degradation, will be used to answer Question 2 of the National Planning Strategy Effectiveness Report.

Calculating Question 3, National Planning Strategy Effectiveness: The change in sage-grouse estimated populations will be calculated from data provided by the state wildlife agencies, when available. This population data (Section I.C., Population [Demographics] Monitoring) will be used to answer Question 3 of the National Planning Strategy Effectiveness Report.

Calculating Question 4, National Planning Strategy Effectiveness: The estimated contribution by the BLM or the USFS to the change in the amount of sagebrush in the area of interest will use the information from Measure 1a (Section I.B.1., Sagebrush Availability). This measure is derived from the national datasets that remove sagebrush (Table 3). To determine the relative contribution of BLM and USFS management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for this measure in the geographic areas of interest. This information will be used to answer Question 4 of the National Planning Strategy Effectiveness Report.

Calculating Question 5, National Planning Strategy Effectiveness: The estimated contribution by the BLM or the USFS to the change in the amount of disturbance in the area of interest will use the information from Measure 2a (Section I.B.2., Monitoring Habitat Degradation) and Measure 3 (Section I.B.3., Energy and Mining Density). These measures are all derived from the national disturbance datasets that degrade habitat (Table 6). To determine the relative contribution of BLM and USFS management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for these two measures in the geographic areas of interest. This information will be used to answer Question 5 of the National Planning Strategy Effectiveness Report.

Answers to the five questions for determining the effectiveness of the national planning strategy will identify areas that appear to be meeting the objectives of the strategy and will facilitate identification of population areas for more detailed analysis. Conceptually, if the broad-scale monitoring identifies increasing sagebrush availability and improving vegetation conditions, decreasing disturbance, and a stable or increasing population for the area of interest, there is evidence that the objectives of the national planning strategy to maintain populations and their habitats have been met. Conversely, where information indicates that sagebrush is decreasing and vegetation conditions are degrading, disturbance in sage-grouse areas is increasing, and/or

populations are declining relative to the baseline, there is evidence that the objectives of the national planning strategy are not being achieved. Such a determination would likely result in a more detailed analysis and could be the basis for implementing more restrictive adaptive management measures.

With respect to the land use plan area, the BLM and the USFS will summarize the vegetation, disturbance, and population data to determine if the LUP is meeting the plan objectives. Effectiveness information used for these evaluations includes BLM/USFS surface management areas and will help inform where finer-scale evaluations are needed, such as seasonal habitats, corridors, or linkage areas. Data will also include the trend of disturbance within the sage-grouse areas, which will inform the need to initiate adaptive management responses as described in the land use plan.

Calculating Question 1, Land Use Plan Effectiveness: The condition of vegetation and the allotments meeting land health standards (as articulated in "BLM Handbook 4180-1, Rangeland Health Standards") in sage-grouse areas will be used to determine the LUP's effectiveness in meeting the vegetation objectives for sage-grouse habitat set forth in the plan. The field office/ranger district will be responsible for collecting this data. In order for this data to be consistent and comparable, common indicators, consistent methods, and an unbiased sampling framework will be implemented following the principles in the BLM's AIM strategy (Taylor et al. 2014; Toevs et al. 2011; MacKinnon et al. 2011), in the BLM's Technical Reference "Interpreting Indicators of Rangeland Health" (Pellant et al. 2005), and in the HAF (Stiver et al. in press) or other approved WAFWA MZ—consistent guidance to measure and monitor sage-grouse habitats. This information will be used to answer Question 1 of the Land Use Plan Effectiveness Report.

Calculating Question 2, Land Use Plan Effectiveness: Sage-grouse areas within the LUP that are achieving land health stands (or, if trend data are available, that are making progress toward achieving them)—particularly the Special Status Species/wildlife habitat land health standard—will be used to determine the LUP's effectiveness in achieving the habitat objectives set forth in the plan. Field offices will follow directions in "BLM Handbook 4180-1, Rangeland Health Standards," to ascertain if sage-grouse areas are achieving or making progress toward achieving land health standards. One of the recommended criteria for evaluating this land health standard is the HAF indicators.

Calculating Question 3, Land Use Plan Effectiveness: The amount of habitat disturbance in sage-grouse areas identified in this LUP will be used to determine the LUP's effectiveness in meeting the plan's disturbance objectives. National datasets can be used to calculate the amount of disturbance, but field office data will likely increase the accuracy of this estimate. This information will be used to answer Question 3 of the Land Use Plan Effectiveness Report.

Calculating Question 4, Land Use Plan Effectiveness: The change in estimated sage-grouse populations will be calculated from data provided by the state wildlife agencies, when available, and will be used to determine LUP effectiveness. This population data (Section I.C., Population [Demographics] Monitoring) will be used to answer Question 4 of the Land Use Plan Effectiveness Report.

Results of the effectiveness monitoring process for the LUP will be used to inform the need for finer-scale investigations, initiate adaptive management actions as described in the land use plan, initiate causation determination, and/or determine if changes to management decisions are warranted. The measures used at the broad and mid scales will provide a suite of characteristics for evaluating the effectiveness of the adaptive management strategy.

II. FINE AND SITE SCALES

Fine-scale (third-order) habitat selected by sage-grouse is described as the physical and geographic area within home ranges during breeding, summer, and winter periods. At this level, habitat suitability monitoring should address factors that affect sage-grouse use of, and movements between, seasonal use areas. The habitat monitoring at the fine and site scale (fourth order) should focus on indicators to describe seasonal home ranges for sage-grouse associated with a lek or lek group within a population or subpopulation area. Fine- and site-scale monitoring will inform LUP effectiveness monitoring (see Section I.D., Effectiveness Monitoring) and the hard and soft triggers identified in the LUP's adaptive management section.

Site-scale habitat selected by sage-grouse is described as the more detailed vegetation characteristics of seasonal habitats. Habitat suitability characteristics include canopy cover and height of sagebrush and the associated understory vegetation. They also include vegetation associated with riparian areas, wet meadows, and other mesic habitats adjacent to sagebrush that may support sage-grouse habitat needs during different stages in their annual cycle.

As described in the Conclusion (Section III), details and application of monitoring at the fine and site scales will be described in the implementation-level monitoring plan for the land use plan. The need for fine- and site-scale-specific habitat monitoring will vary by area, depending on proposed projects, existing conditions, habitat variability, threats, and land health. Examples of fine- and site-scale monitoring include: habitat vegetation monitoring to assess current habitat conditions; monitoring and evaluation of the success of projects targeting sage-grouse habitat enhancement and/or restoration; and habitat disturbance monitoring to provide localized disturbance measures to inform proposed project review and potential mitigation for project impacts. Monitoring plans should incorporate the principles outlined in the BLM's AIM strategy (Toevs et al. 2011) and in "AIM-Monitoring: A Component of the Assessment, Inventory, and Monitoring Strategy" (Taylor et al. 2014). Approved monitoring methods are:

- "BLM Core Terrestrial Indicators and Methods" (MacKinnon et al. 2011);
- The BLM's Technical Reference "Interpreting Indicators of Rangeland Health" (Pellant et al. 2005); and,
- "Sage-Grouse Habitat Assessment Framework: Multiscale Assessment Tool" (Stiver et al. *in press*).

Other state-specific disturbance tracking models include: the BLM's Wyoming Density and Disturbance Calculation Tool (http://ddct.wygisc.org/) and the BLM's White River Data Management System in development with the USGS. Population monitoring data (in cooperation with state wildlife agencies) should be included during evaluation of the effectiveness of actions taken at the fine and site scales.

Fine- and site-scale sage-grouse habitat suitability indicators for seasonal habitats are identified in the HAF. The HAF has incorporated the Connelly et al. (2000) sage-grouse guidelines as well as many of the core indicators in the AIM strategy (Toevs et al. 2011). There may be a need to develop adjustments to height and cover or other site suitability values described in the HAF; any such adjustments should be ecologically defensible. To foster consistency, however, adjustments to site suitability values at the local scale should be avoided unless there is strong, scientific justification for making those adjustments. That justification should be provided. WAFWA MZ adjustments must be supported by regional plant productivity and habitat data for the floristic province. If adjustments are made to the site-scale indicators, they must be made using data from the appropriate seasonal habitat designation (breeding/nesting, brood-rearing, winter) collected from sage-grouse studies found in the relevant area and peer-reviewed by the appropriate wildlife management agency(ies) and researchers.

When conducting land heath assessments, the BLM should follow, at a minimum, "Interpreting Indicators of Rangeland Health" (Pellant et. al. 2005) and the "BLM Core Terrestrial Indicators and Methods" (MacKinnon et al. 2011). For assessments being conducted in sage-grouse designated management areas, the BLM should collect additional data to inform the HAF indicators that have not been collected using the above methods. Implementation of the principles outlined in the AIM strategy will allow the data to be used to generate unbiased estimates of condition across the area of interest; facilitate consistent data collection and rollup analysis among management units; help provide consistent data to inform the classification and interpretation of imagery; and provide condition and trend of the indicators describing sagebrush characteristics important to sage-grouse habitat (see Section I.D., Effectiveness Monitoring).

III. CONCLUSION

This Greater Sage-Grouse Monitoring Framework was developed for all of the Final Environmental Impact Statements involved in the sage-grouse planning effort. As such, it describes the monitoring activities at the broad and mid scales and provides a guide for the BLM and the USFS to collaborate with partners/other agencies to develop the land use plan-specific monitoring plan.

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Attachment A. An Overview of Monitoring Commitments

		В	road and Mid Sca	ales		Fine and Site
	Implemen- tation	Sagebrush Availability	Habitat Degradation	Population	Effectiveness	Scales
How will the data be used?	•	Track changes in land cover (sagebrush) and inform adaptive management	Track changes in disturbance (threats) to sage- grouse habitat and inform adaptive management	Track trends in sage-grouse populations (and/or leks; as determined by state wildlife agencies) and inform adaptive management	relationship among disturbance, implementation actions, and sagebrush	Measure seasonal habitat, connectivity at the fine scale, and habitat conditions at the site scale, calculate disturbance, and inform adaptive management
Who is collecting the data?	BLM FO and USFS Forest	NOC and NIFC	National datasets (NOC), BLM FOs, and USFS Forests as applicable	State wildlife agencies through WAFWA	Comes from other broad- and mid-scale monitoring types, analyzed by the NOC	BLM FO and SO, USFS Forests and RO (with partners)
How often are the data collected, reported, and made available to USFWS?	Collected and reported annually; summary report every 5 years	Updated and changes reported annually; summary report every 5 years	Collected and changes reported annually; summary report every 5 years	State data reported annually per WAFWA MOU; summary report every 5 years	with LUP evaluations)	Collection and trend analysis ongoing, reported every 5 years or as needed to inform adaptive management
What is the spatial scale?	Summarized by LUP with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	PACs (size dependent) with flexibility for	PACs (size dependent) with flexibility	Summarized by MZ and LUP with flexibility for reporting by other units (e.g., PAC)	Variable (e.g., projects and seasonal habitats)
What are the potential personnel and budget impacts?	Additional capacity or re- prioritization of ongoing monitoring work and budget realignment	At a minimum, current skills and capacity must be maintained; data management costs are TBD	At a minimum, current skills and capacity must be maintained; data management and data layer purchase cost are TBD	budget impacts for the BLM or the USFS	Additional capacity or re- prioritization of ongoing monitoring work and budget realignment	Additional capacity or re- prioritization of ongoing monitoring work and budget realignment

Who has	1)	BLM FO	1)	NOC	1)	NOC	1)	WAFWA	1)	Broad and	1)	BLM FO &
primary		& SO;	2)	WO	2)	BLM SO,		& state		mid scale at		USFS Forests
and		USFS				USFS RO,		wildlife		the NOC,	2)	BLM SO &
secondary		Forest &				&		agencies		LUP at		USFS RO
responsi-		RO				appropriate	2)	BLM SO,		BLM SO,		
bilities for	2)	BLM &				programs		USFS RO,		USFS RO		
reporting?		USFS						NOC				
		Planning										
What new	Nat	tional	Up	dates to	Dat	a standards	Sta	ndards in	Rep	oorting	Dat	a standards
processes/	imp	olementation	nat	ional land	and	l rollup	pop	ulation	met	thodologies	data	a storage; and
tools are	data	asets and	cov	er data	me	thods for	mo	nitoring			rep	orting
needed?	ana	llysis tools			the	se data	(W.	AFWA)				

FO (field office); NIFC (National Interagency Fire Center); NOC (National Operations Center); RO (regional office); SO (state office); TBD (to be determined); WO (Washington Office)

Attachment B. User and Producer Accuracies for Aggregated Ecological Systems within LANDFIRE Map Zones

LANDFIRE Map Zone Name	User Accuracy	Producer Accuracy	% of Map Zone within Historical Schroeder
Wyoming Basin	76.9%	90.9%	98.5%
Snake River Plain	68.8%	85.2%	98.4%
Missouri River Plateau	57.7%	100.0%	91.3%
Grand Coulee Basin of the Columbia Plateau	80.0%	80.0%	89.3%
Wyoming Highlands	75.3%	85.9%	88.1%
Western Great Basin	69.3%	75.4%	72.9%
Blue Mountain Region of the Columbia Plateau	85.7%	88.7%	72.7%
Eastern Great Basin	62.7%	80.0%	62.8%
Northwestern Great Plains	76.5%	92.9%	46.3%
Northern Rocky Mountains	72.5%	89.2%	42.5%
Utah High Plateaus	81.8%	78.3%	41.5%
Colorado Plateau	65.3%	76.2%	28.8%
Middle Rocky Mountains	78.6%	73.3%	26.4%
Cascade Mountain Range	57.1%	88.9%	17.3%
Sierra Nevada Mountain Range	0.0%	0.0%	12.3%
Northwestern Rocky Mountains	66.7%	60.0%	7.3%
Southern Rocky Mountains	58.6%	56.7%	7.0%
Northern Cascades	75.0%	75.0%	2.6%
Mogollon Rim	66.7%	100.0%	1.7%
Death Valley Basin	0.0%	0.0%	1.2%

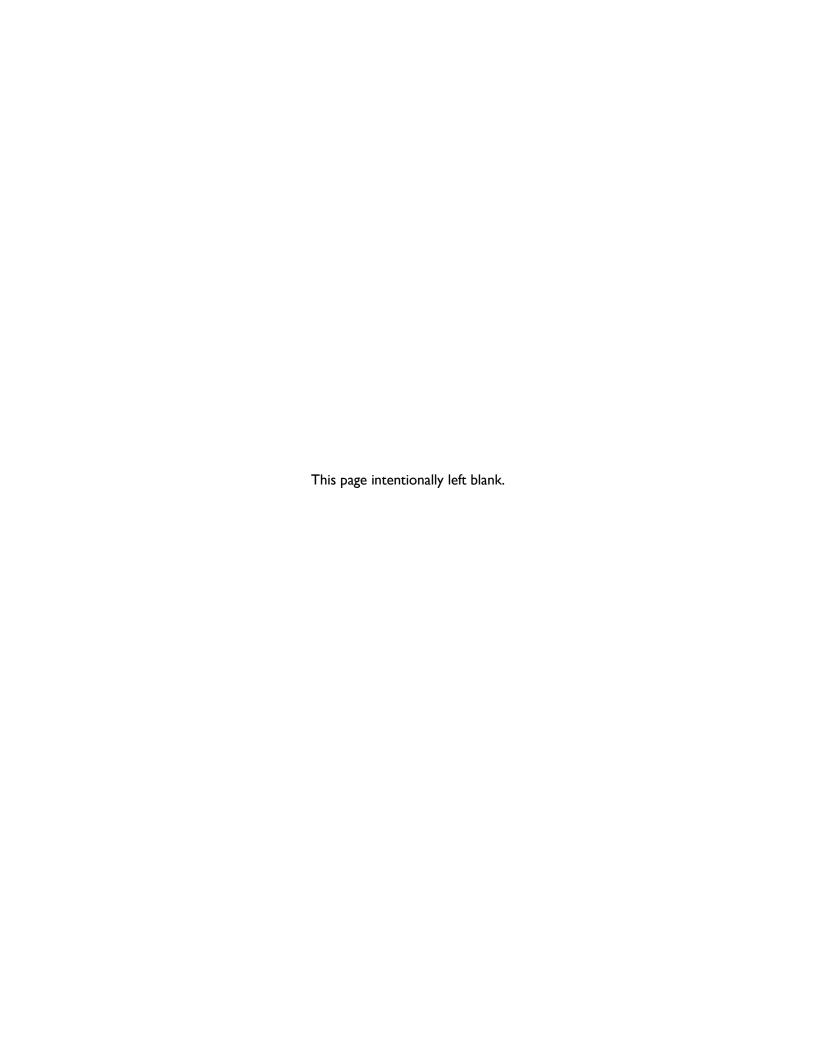
There are two anomalous map zones with 0% user and producer accuracies, attributable to no available reference data for the ecological systems of interest.

User accuracy is a map-based accuracy that is computed by looking at the reference data for a class and determining the percentage of correct predictions for these samples. For example, if I select any sagebrush pixel on the classified map, what is the probability that I'll be standing in a sagebrush stand when I visit that pixel location in the field? *Commission Error* equates to including a pixel in a class when it should have been excluded (i.e., commission error = 1 – user's accuracy).

Producer accuracy is a reference-based accuracy that is computed by looking at the predictions produced for a class and determining the percentage of correct predictions. In other words, if I know that a particular area is sagebrush (I've been out on the ground to check), what is the probability that the digital map will correctly identify that pixel as sagebrush? **Omission Error** equates to excluding a pixel that should have been included in the class (i.e., omission error = 1 – producer's accuracy).

Attachment C. Sagebrush Species and Subspecies Included in the Selection Criteria for Building the EVT and BpS Layers

- Artemisia arbuscula subspecies longicaulis
- Artemisia arbuscula subspecies longiloba
- Artemisia bigelovii
- Artemisia nova
- Artemisia papposa
- Artemisia pygmaea
- Artemisia rigida
- Artemisia spinescens
- Artemisia tripartita subspecies rupicola
- Artemisia tripartita subspecies tripartita
- Tanacetum nuttallii
- Artemisia cana subspecies bolanderi
- Artemisia cana subspecies cana
- Artemisia cana subspecies viscidula
- Artemisia tridentata subspecies wyomingensis
- Artemisia tridentata subspecies tridentata
- Artemisia tridentata subspecies vaseyana
- Artemisia tridentata subspecies spiciformis
- Artemisia tridentata subspecies xericensis
- Artemisia tridentata variety pauciflora
- Artemisia frigida
- Artemisia pedatifida



Appendix F

Greater Sage-Grouse Disturbance Cap Guidance

APPENDIX F GREATER SAGE-GROUSE DISTURBANCE CAP GUIDANCE

GREATER SAGE-GROUSE (GRSG) DISTURBANCE CAPS

In the USFWS's 2010 listing decision for sage-grouse, the USFWS identified 18 threats contributing to the destruction, modification, or curtailment of the sage-grouse's habitat or range (75 FR 13910 2010. The 18 threats have been aggregated into three measures:

- Sagebrush Availability (percent of sagebrush per unit area)
- Habitat Degradation (percent of human activity per unit area)
- Density of Energy and Mining (facilities and locations per unit area)

Habitat Degradation and Density of Energy and Mining will be evaluated under the Disturbance Cap and Density Cap respectively and are further described in this appendix. The three measures, in conjunction with other information, will be considered during the NEPA process for projects authorized or undertaken by the BLM.

Disturbance Cap for Northeastern California

For lands in California, this land use plan has incorporated a 3% disturbance cap within Greater Sage-Grouse (GRSG) Priority Habitat Management Areas (PHMAs) and the subsequent land use planning actions if the cap is met:

If the 3% anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) within GRSG Priority Habitat Management Areas (PHMA)in any given Biologically Significant Unit (BSU), then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 hard rock mining law, valid existing rights, etc.) will be permitted by BLM within GRSG PHMAs in any given BSU until the disturbance has been reduced to less than the cap.

If the 3% disturbance cap is exceeded on all lands (regardless of land ownership) within a proposed project analysis area in a PHMA, then no further anthropogenic disturbance will be permitted by BLM until disturbance in the proposed project analysis area has been reduced to maintain the area under the cap (subject to applicable laws and regulations, such as the 1872 hard rock mining law, valid existing rights, etc.).

Disturbance Cap for Nevada

In Nevada, this land use plan has incorporated a 3% disturbance management protocol for lands within the State of Nevada for Greater Sage-Grouse (GRSG) Priority Habitat Management Areas (PHMAs). For BLM land in the state of Nevada only, the following Disturbance Management Protocol (DMP) is intended to provide for a 3 percent limitation on disturbance, except in situations where a biological analysis indicates a net conservation gain to the species.

Such discretionary activities that would cause disturbances in excess of 3 percent at the project or BSU scale would be prohibited, unless a technical team described below determines that new or site-specific information indicates the project could be modified to result in a net conservation gain at the BSU level. Factors considered by the team will include GRSG abundance and trends, habitat amount and quality, extent of project disturbance, location and density of existing disturbance, project design options and other biological factors.

Any exceptions to the 3 percent disturbance limitation may be approved by the Authorized Officer only with the concurrence of the State Director. The Authorized Officer may not grant an exception unless the NDOW, the USFWS, and the BLM unanimously find that the proposed action satisfies the conditions stated in the above paragraph. Such finding shall initially be made by the technical team, which consists of a field biologist or other GRSG experts from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the BLM State Director, USFWS State Ecological Services Director and NDOW Director for final resolution. In the event their finding is not unanimous, the exception will not be granted.

The disturbance cap applies to the PHMA within both the Biologically Significant Units (BSU) and at the project authorization scale. For the BSUs, west-wide habitat degradation (disturbance) data layers (**Table F-I**) will be used at a minimum to calculate the amount of disturbance and to determine if the disturbance cap has been exceeded as the land use plans (LUP) are being implemented. Locally collected disturbance data will be used to determine if the disturbance cap has been exceeded for project authorizations, and may also be used to calculate the amount of disturbance in the BSUs.

Although locatable mine sites are included in the degradation calculation, mining activities under the 1872 mining law may not be subject to the 3% disturbance cap. Details about locatable mining activities will be fully disclosed and analyzed in the NEPA process to assess impacts to sage-grouse and their habitat as well as to BLM goals and objectives, and other BLM programs and activities.

Formulas for calculations of the amount of disturbance in the PHMA in a BSU and or in a proposed project area are as follows:

For the BSUs:

% Degradation Disturbance = (combined acres of the 12 degradation threats 1) ÷ (acres of all lands within the PHMAs in a BSU) x 100.

For the Project Analysis Area:

% Degradation Disturbance = (combined acres of the 12 degradation threats¹ plus the 7 site scale threats²) \div (acres of all lands within the PHMA in the project analysis area) \times 100.

The denominator in the disturbance calculation formula consists of all acres of lands classified as PHMA within the analysis area (BSU or project area). Areas that are not sage-grouse seasonal habitats, or are not currently supporting sagebrush cover (e.g., due to wildfire), are not excluded from the acres of PHMA in the denominator of the formula. Information regarding sage-grouse seasonal habitats, sagebrush availability, and areas with the potential to support sage-grouse populations will be considered along with other local conditions that may affect sage-grouse during the analysis of the proposed project area.

Project Analysis Area Method for Permitting Surface Disturbance Activities

- Determine potentially affected occupied leks by placing a four mile boundary around the proposed area of physical disturbance related to the project. All occupied leks located within the four mile project boundary and within PHMA will be considered affected by the project.
- Next, place a four mile boundary around each of the affected occupied leks.
- The PHMA within the four mile lek boundary and the four mile project boundary creates the project analysis area for each individual project. If there are no occupied leks within the four-mile project boundary, the project analysis area will be that portion of the four-mile project boundary within the PHMA.
- Digitize all existing anthropogenic disturbances identified in Table
 F-I and the 7 additional features that are considered threats to sage-grouse (Table F-2). Using I meter resolution NAIP imagery is recommended. Use existing local data if available.

[⊥] See **Table F-I**.

² See **Table F-2**.

- Calculate percent existing disturbance using the formula above. If existing disturbance is less than 3%, proceed to next step. If existing disturbance is greater than 3%, defer the project in California, and apply the disturbance management protocol in Nevada.
- Add proposed project disturbance footprint area and recalculate the percent disturbance. If disturbance is less than 3%, proceed to next step. If disturbance is greater than 3%, defer project in California, and apply the disturbance management protocol in Nevada.
- For BLM-administered lands in Northeastern California, calculate the disturbance density of energy and mining facilities (listed above). If the disturbance density is less than I facility per 640 acres, averaged across project analysis area, proceed to the NEPA analysis incorporating mitigation measures into an alternative. If the disturbance density is greater than I facility per 640 acres, averaged across the project analysis area, either defer the proposed project or co-locate it into existing disturbed area.
- If a project that would exceed the degradation cap or density cap cannot be deferred due to valid existing rights or other existing laws and regulations, fully disclose the local and regional impacts of the proposed action in the associated NEPA.

DENSITY CAP FOR NORTHEASTERN CALIFORNIA

For BLM land in the state of California only, this land use plan has also incorporated a cap on the density of energy and mining facilities at an average of I facility per 640 acres in PHMA in a project authorization area. If the disturbance density in the PHMA in a proposed project area is on average less than I facility per 640 acres, the analysis will proceed through the NEPA process incorporating mitigation measures into an alternative. If the disturbance density is greater than an average of I facility per 640 acres, the proposed project will either be deferred until the density of energy and mining facilities is less than the cap or co-located it into existing disturbed area (subject to applicable laws and regulations, such as the General Mining Law of 1872, as amended, valid existing rights, etc.). Facilities included in the density calculation (**Table F-3**) are:

- Energy (oil and gas wells and development facilities)
- Energy (coal mines)
- Energy (wind towers)
- Energy (solar fields)
- Energy (geothermal)
- Mining (active locatable, leasable, and saleable developments)

Table F-I

Anthropogenic Disturbance Types for Disturbance Calculations

Data Sources are Described for the West-Wide Habitat Degradation Estimates

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO- 300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO- 300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO- 300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO- 300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO- 300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	I-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO- 300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO- 300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO- 300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO- 300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO- 300

Table F-2

The Seven Site Scale Features Considered Threats to Sage-Grouse Included in the Disturbance Calculation for Project Authorizations

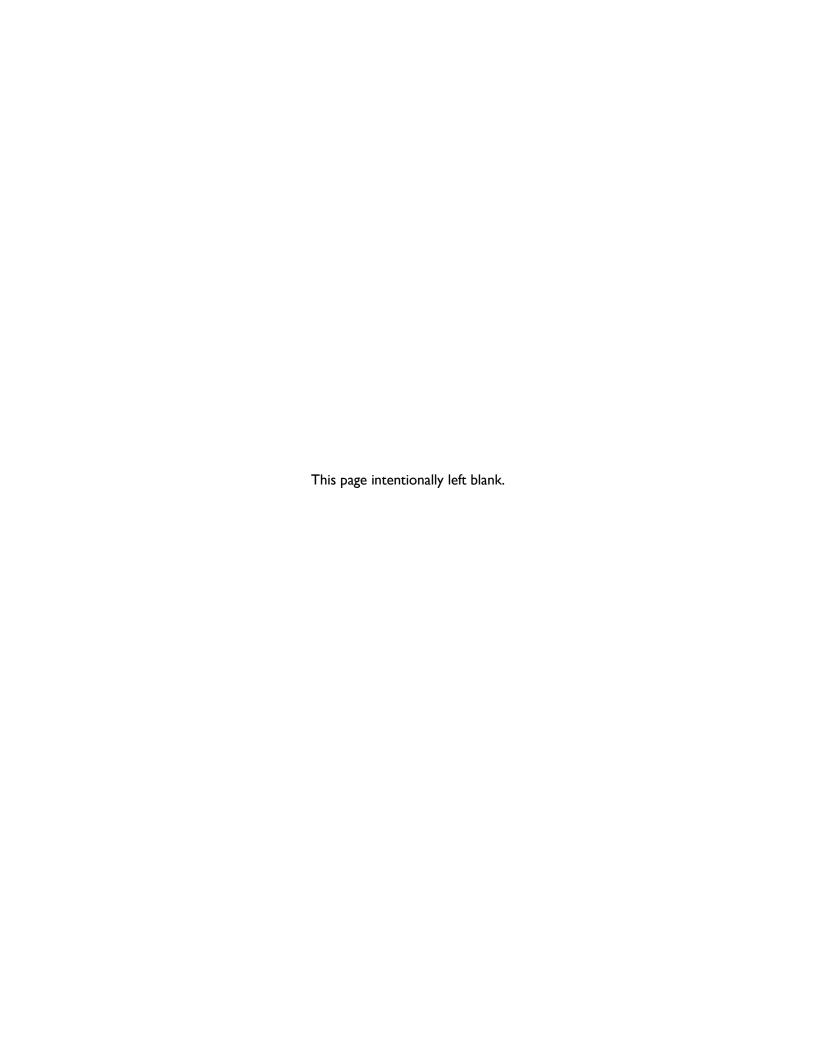
- I. Coalbed Methane Ponds
- 2. Meteorological Towers
- 3. Nuclear Energy Facilities
- 4. Airport Facilities and Infrastructure
- 5. Military Range Facilities & Infrastructure
- 6. Hydroelectric Plants
- 7. Recreation Areas Facilities and Infrastructure

Definitions:

- I. Coalbed Methane and other Energy-related Retention Ponds The footprint boundary will follow the fenceline and includes the area within the fenceline surrounding the impoundment. If the pond is not fenced, the impoundment itself is the footprint. Other infrastructure associated with the containment ponds (roads, well pads, etc.) will be captured in other disturbance categories.
- 2. Meteorological Towers This feature includes long-term weather monitoring and temporary meteorological towers associated with short-term wind testing. The footprint boundary includes the area underneath the guy wires.
- **3.** Nuclear Energy Facilities The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.
- 4. Airport Facilities and Infrastructure (public and private) The footprint boundary will follow the boundary of the airport or heliport and includes mowed areas, parking lots, hangers, taxiways, driveways, terminals, maintenance facilities, beacons and related features. Indicators of the boundary, such as distinct land cover changes, fences and perimeter roads, will be used to encompass the entire airport or heliport.
- **5. Military Range Facilities & Infrastructure –** The footprint boundary will follow the outer edge of the disturbed areas around buildings and includes undisturbed areas within the facility's perimeter.
- **6. Hydroelectric Plants –** The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.
- **7. Recreation Areas & Facilities –** This feature includes all sites/facilities larger than 0.25 acres in size. The footprint boundary will include any undisturbed areas within the site/facility.

Table F-3
Relationship Between the 18 Threats and the Three Habitat Disturbance Measures for Monitoring and Disturbance Calculations

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Energy and Mining Density	
Agriculture	X			
Urbanization	X			
Wildfire	X			
Conifer encroachment	X			
Treatments	X			
Invasive Species	X			
Energy (oil and gas wells and development facilities)		X	X	
Energy (coal mines)		X	X	
Energy (wind towers)		X	X	
Energy (solar fields)		X	X	
Energy (geothermal)		X	X	
Mining (active locatable, leasable, and saleable developments)		X	X	
Infrastructure (roads)		X		
Infrastructure (railroads)		X		
Infrastructure (power lines)		X		
Infrastructure (communication towers)		X		
Infrastructure (other vertical structures)		X		
Other developed rights-of-way		X		



Appendix H Chapter 2 Figures

APPENDIX H CHAPTER 2 FIGURES

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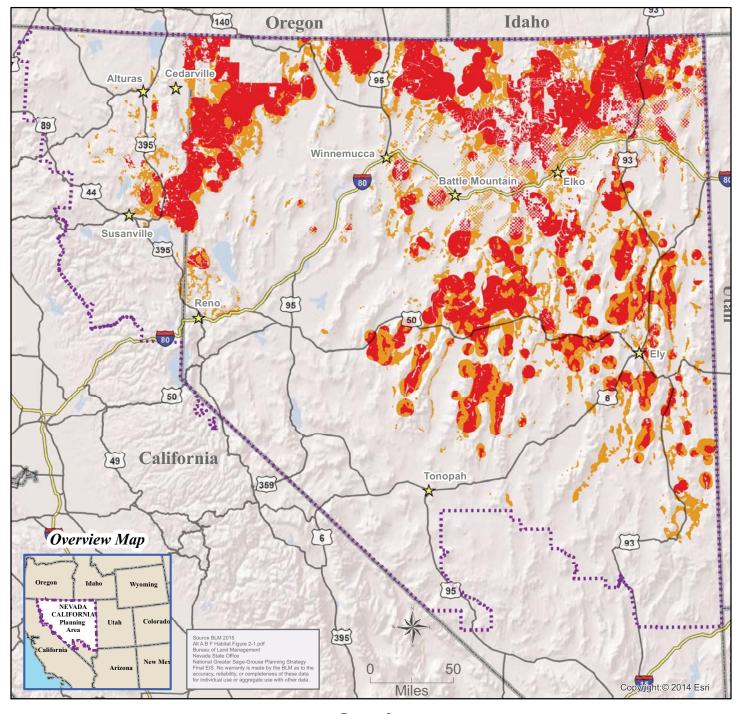
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NV-NECA Greater Sage-Grouse Habitat

Alternative A, B, F





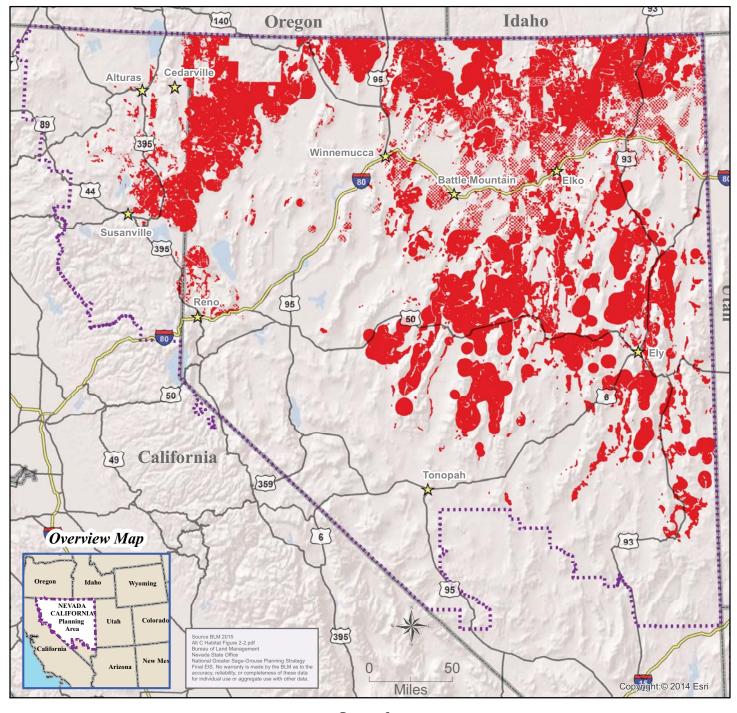
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NV-NECA Greater Sage-Grouse Habitat Alternative C





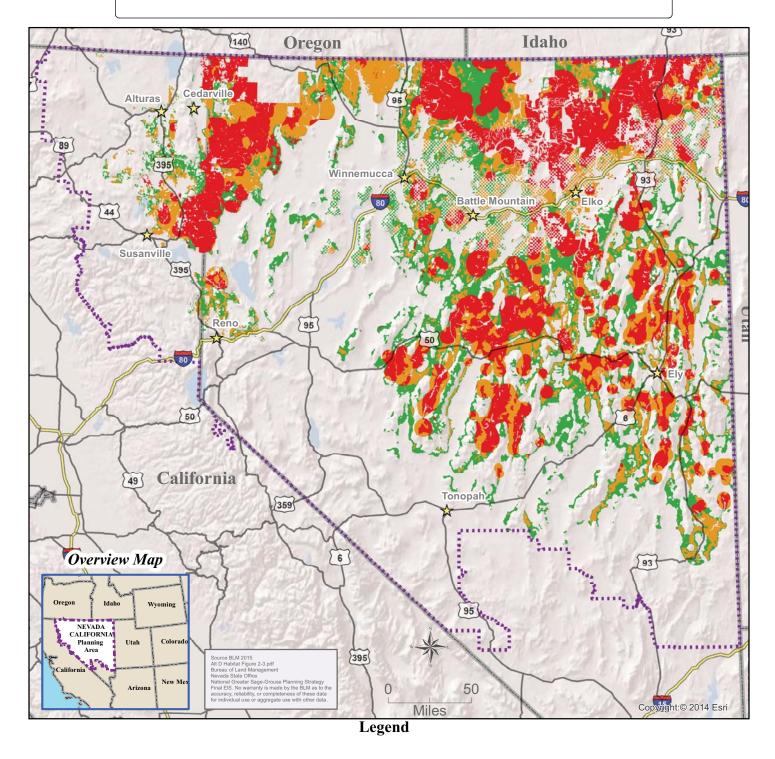
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NV-NECA Greater Sage-Grouse Habitat Alternative D





Greater Sage-Grouse Habitat

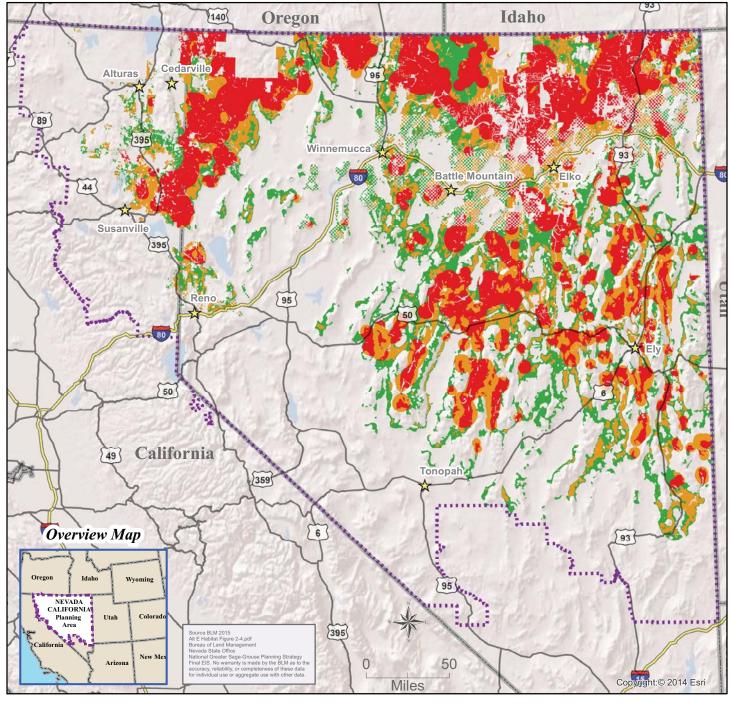
BLM/FS Priority Habitat
Management Area (PHMA)
BLM/FS General Habitat
Management Area (GHMA)
BLM/FS Other Habitat
Management Area (OHMA)

City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat Alternative E





Legend

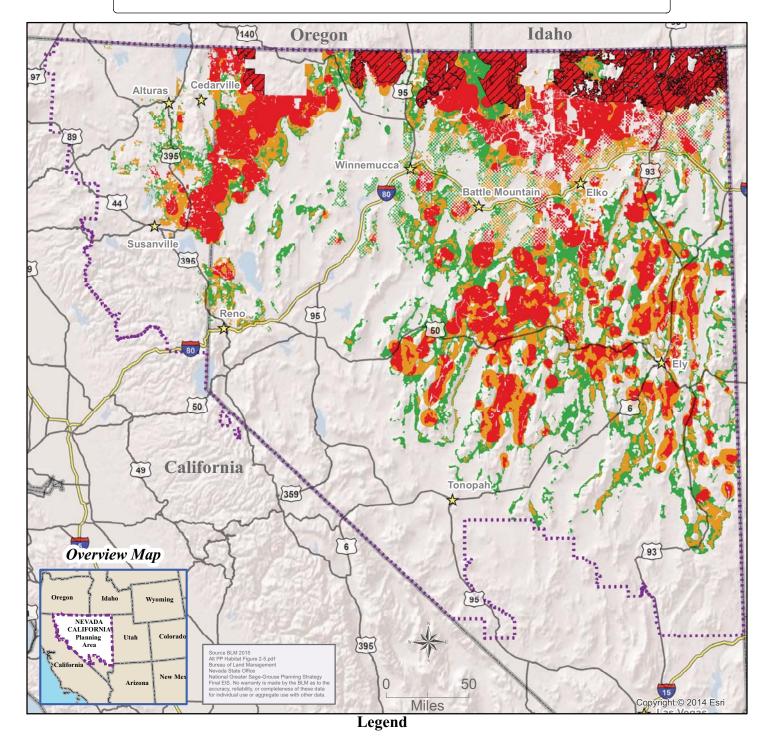




NV-NECA Greater Sage-Grouse Habitat

Proposed Plan





Greater Sage-Grouse Habitat

BLM/FS Priority Habitat
Management Area (PHMA)

BLM/FS General Habitat
Management Area (GHMA)

BLM/FS Other Habitat
Management Area (OHMA)

BLM/FS Other Habitat
Management Area (OHMA)

City/Town

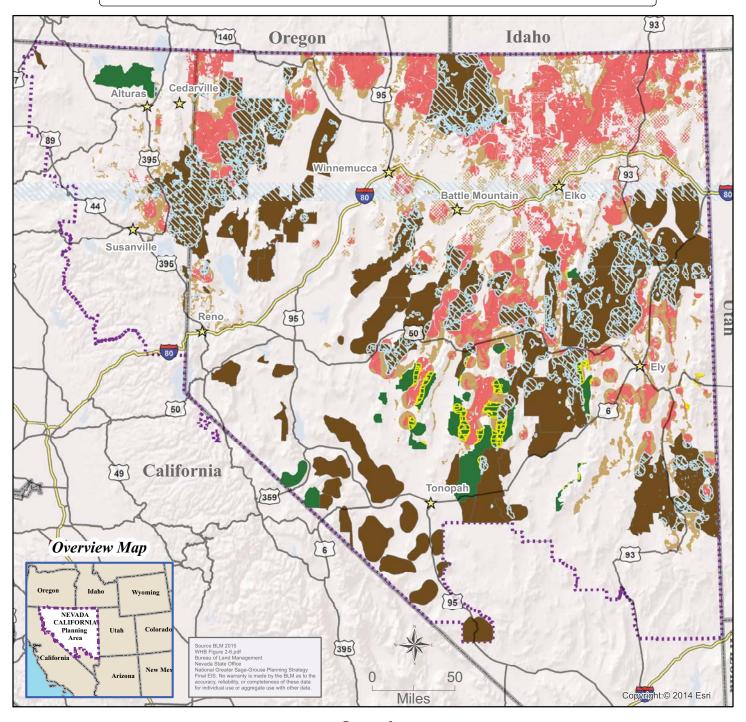
Interstate
US Route
States
Planning Area
Sagebrush Focal Areas



Wild Horse and Burros, Herd Management Areas, USFS Wild Horse and Burro Territories



Alternative A, B, C, D, E, F





Merd Management Areas within Habitat **NV-NECA Herd Management Areas**

USFS Wild Horse & Burro Territories within Habitat

NV-NECA USFS Wild Horse & Burro Territories

Legend

☆ City/Town

Interstate

US Route

States

Planning Area

Priority Habitat Management Area (PHMA)

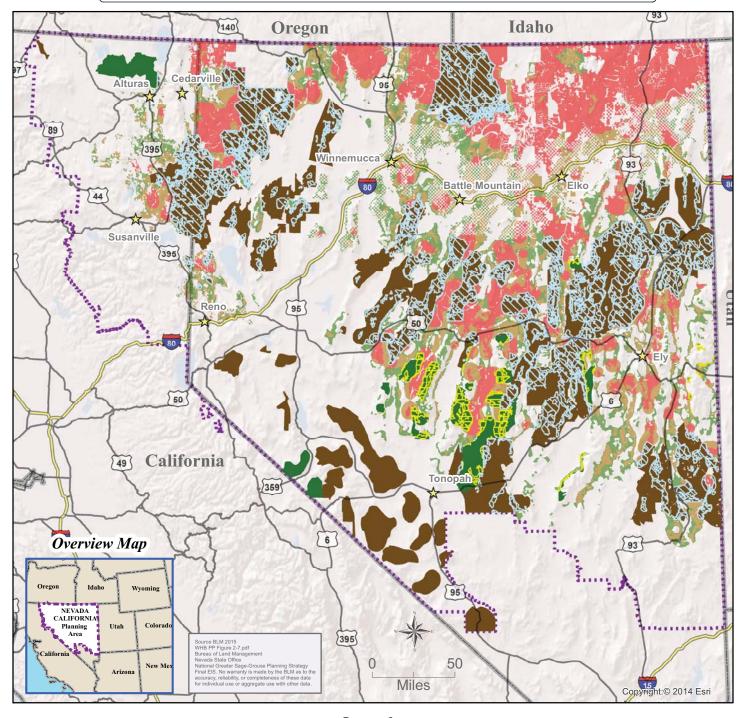
General Habitat Management Area (GHMA)



Wild Horse and Burros, Herd Management Areas, USFS Wild Horse and Burro Territories



Proposed Plan



Legend



NV-NECA Herd Management Areas

USFS Wild Horse & Burro Territories within Habitat

NV-NECA USFS Wild Horse & Burro Territories

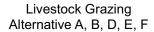
City/Town Interstate US Route

States Planning Area Priority Habitat Management Areas General Habitat Management Areas

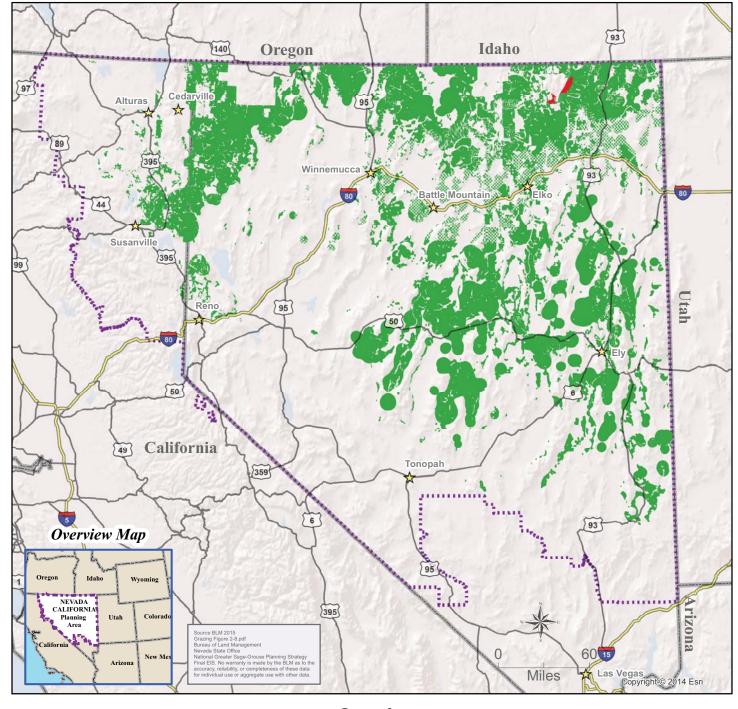
Other Habitat Management Areas



NV-NECA Greater Sage-Grouse Habitat







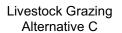
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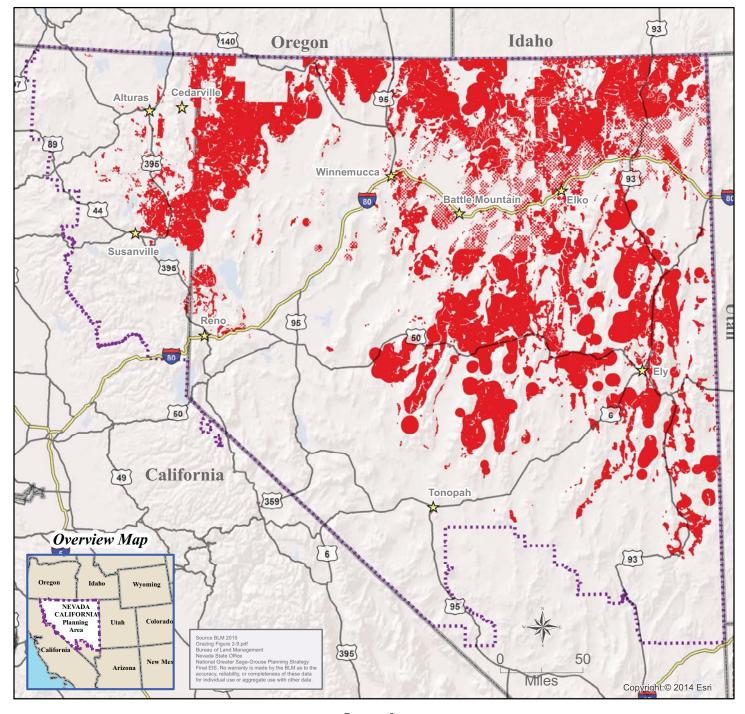




NV-NECA Greater Sage-Grouse Habitat





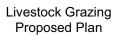


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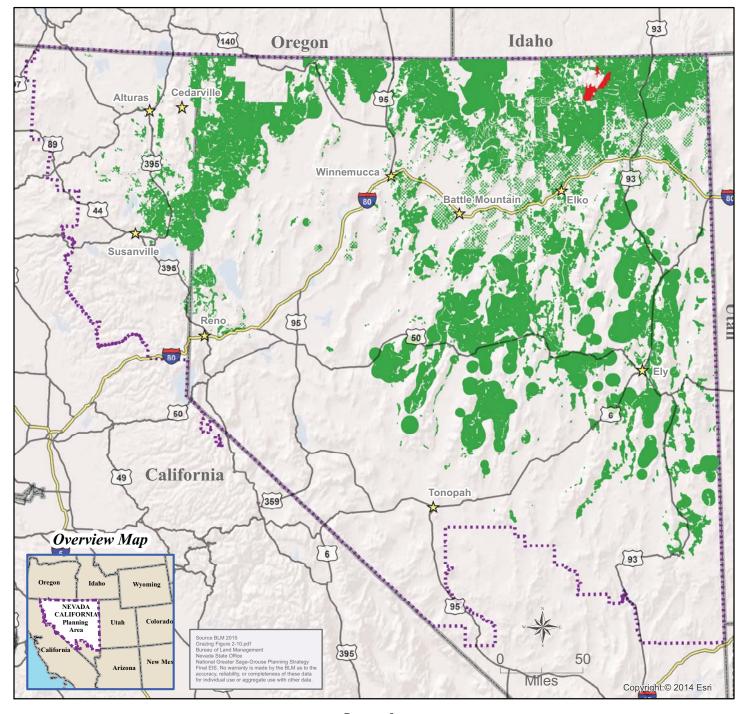




NV-NECA Greater Sage-Grouse Habitat







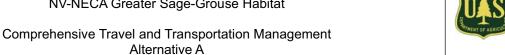
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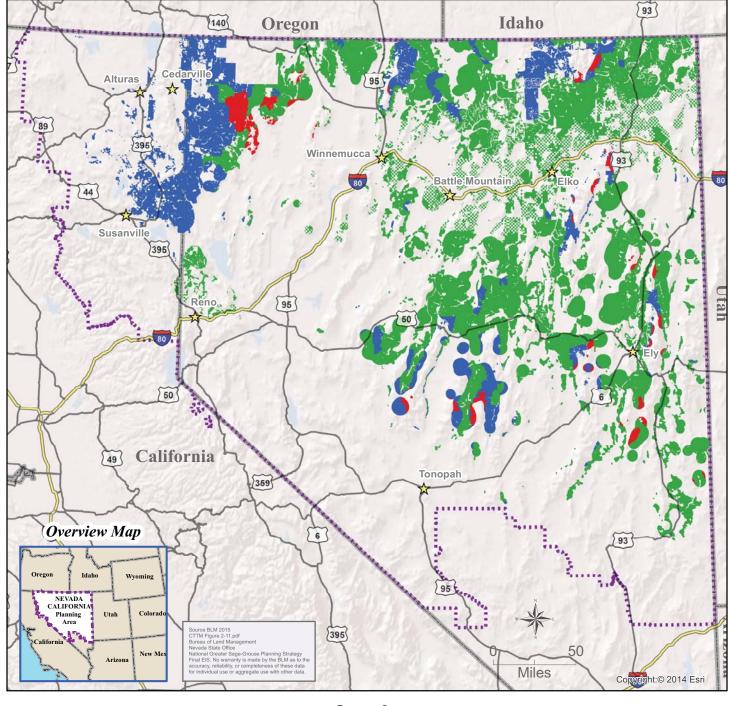




NV-NECA Greater Sage-Grouse Habitat







Legend

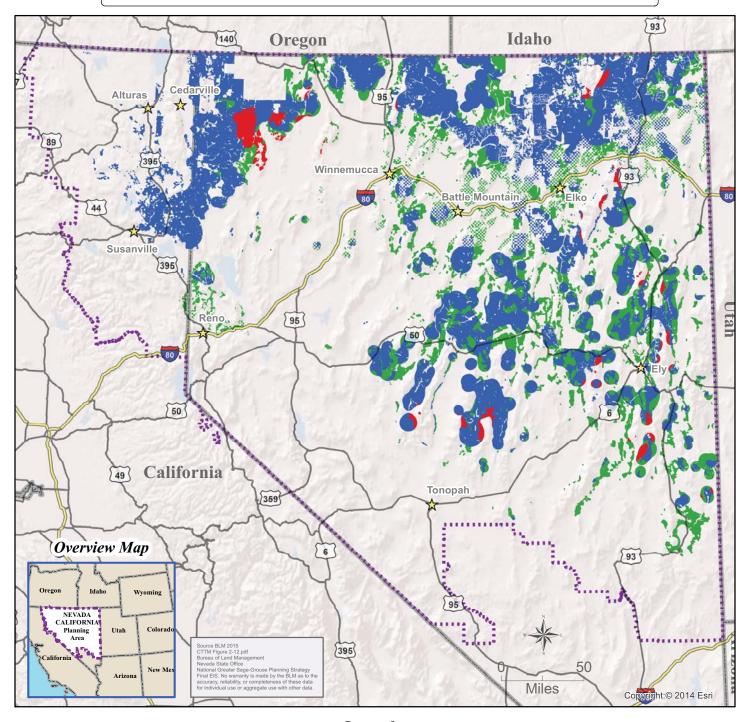
City/Town Interstate Travel and Transportation Closed Areas US Route Travel and Transportation Limited Areas Travel and Transportation Open Areas States Planning Area



NV-NECA Greater Sage-Grouse Habitat



Comprehensive Travel and Transportation Management Alternative B



Legend

Travel and Transportation Closed Areas
Travel and Transportation Limited Areas
Travel and Transportation Open Areas

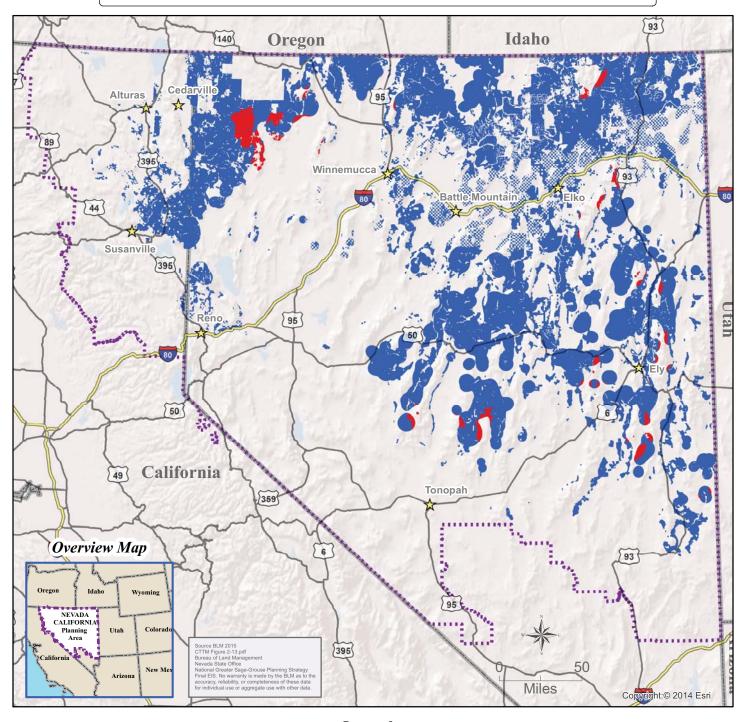




NV-NECA Greater Sage-Grouse Habitat



Comprehensive Travel and Transportation Management Alternative C, D, E, F



Legend

Travel and Transportation Closed Areas
Travel and Transportation Limited Areas
Travel and Transportation Open Areas

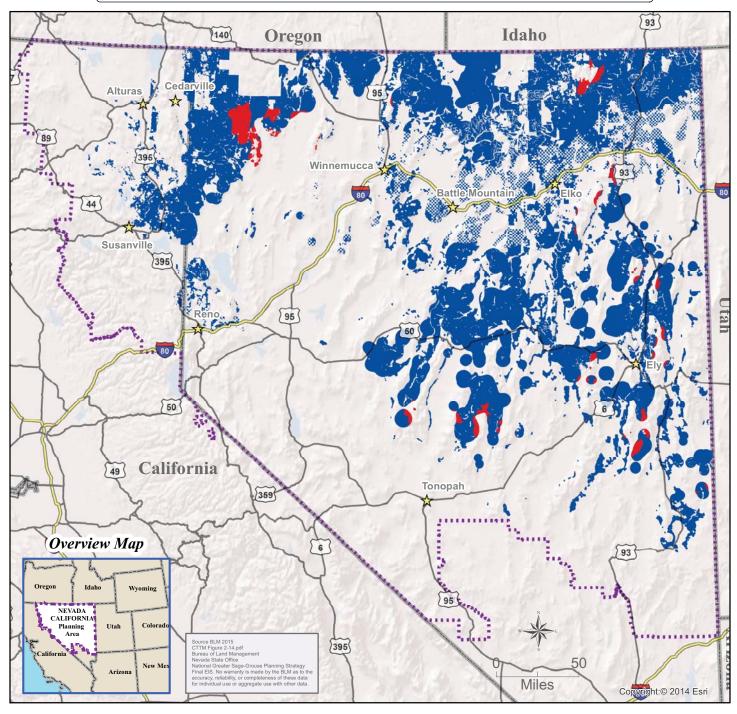
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat



Comprehensive Travel and Transportation Management Proposed Plan



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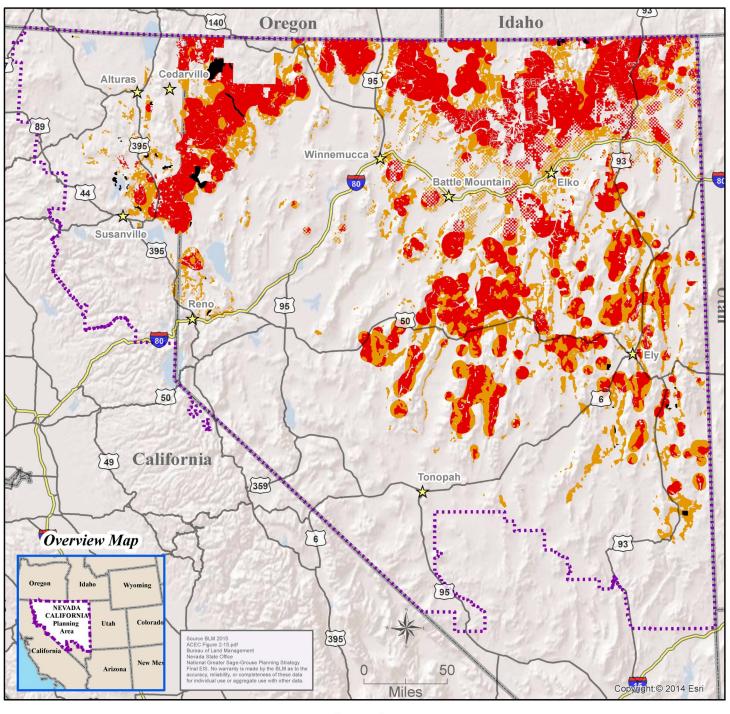




NV-NECA Greater Sage-Grouse Habitat



Designated Areas of Critical Environmental Concern Alternative A, B, D, E and Proposed Plan



Legend

ACEC Designated

Priority Habitat Management Area (PHMA)

General Habitat Management Area (GHMA)

City/Town

Interstate

US Route

States

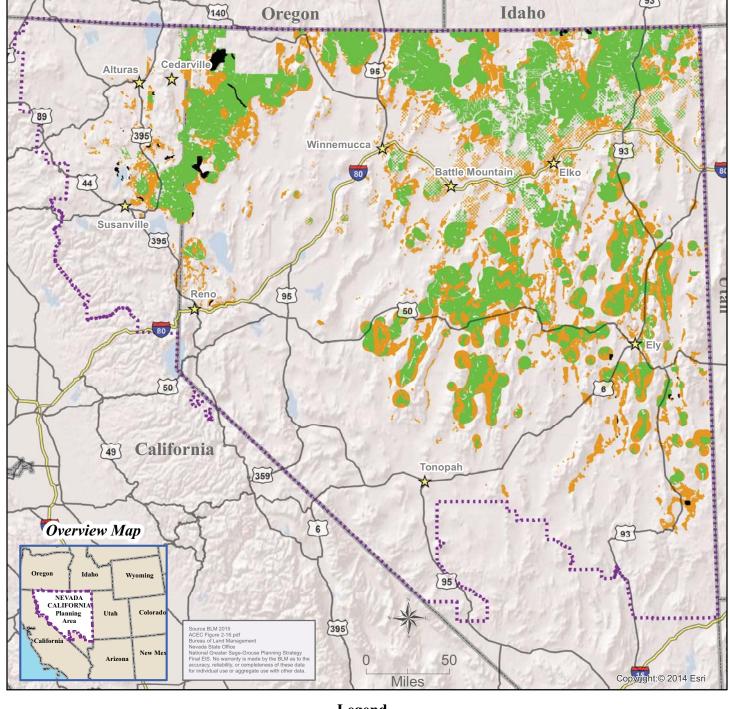
Planning Area



NV-NECA Greater Sage-Grouse Habitat







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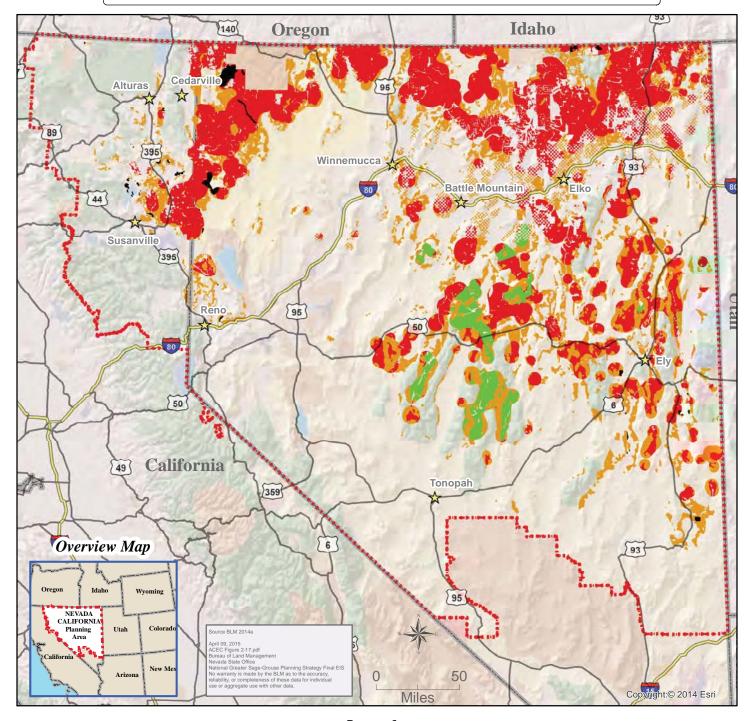




NV-NECA Greater Sage-Grouse Habitat



Proposed Areas of Critical Environmental Concern Alternative F



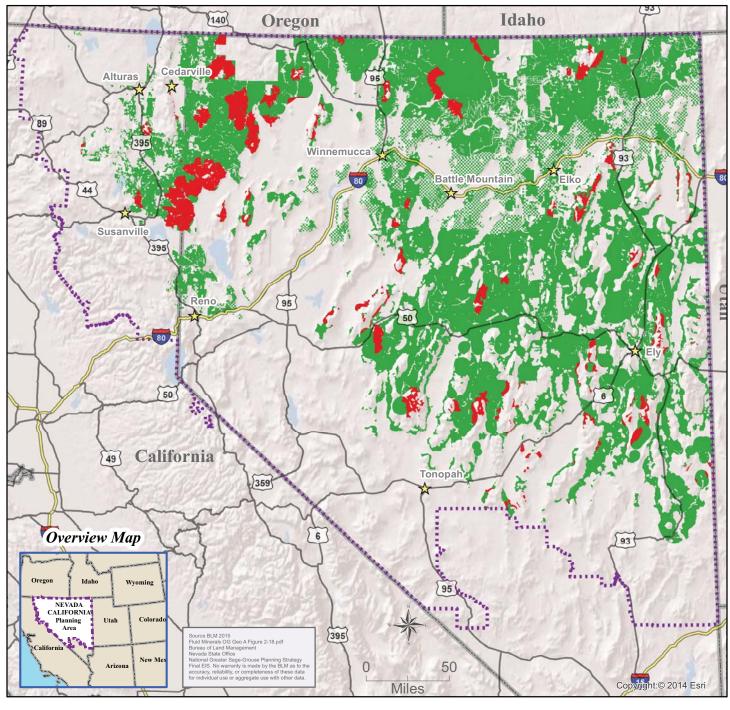
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NV-NECA Greater Sage-Grouse Habitat Fluid Minerals Oil & Gas and Geothermal Alternative A





Legend

Fluid Minerals: Closed

Fluid Minerals: Open Major
Stipulations (NSO)

Fluid Minerals: Open Moderate
Stipulations (CSU/TL)

Fluid Minerals: Open Standard

Fluid Minerals: Open Standard Stipulations

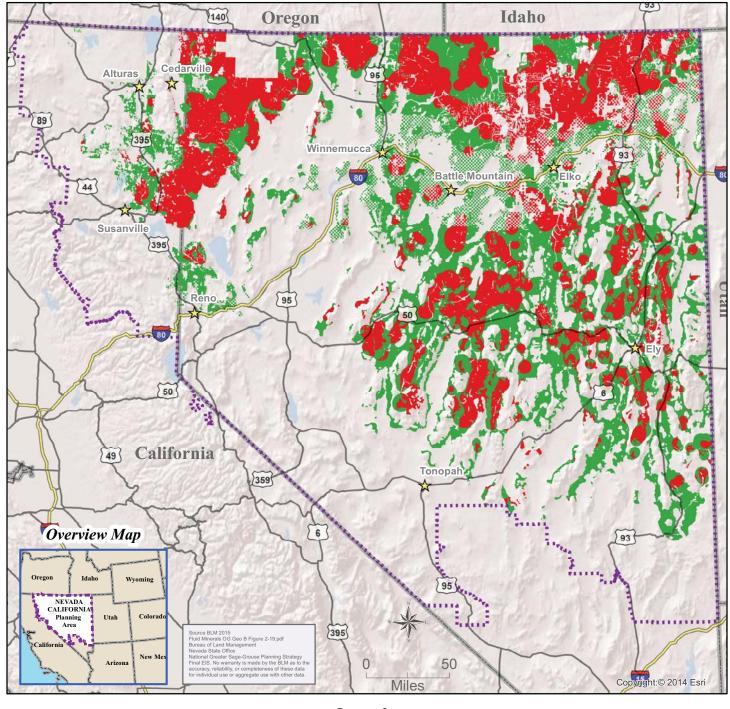
City/Town
Interstate
US Route
States

Planning Area



NV-NECA Greater Sage-Grouse Habitat Fluid Minerals Oil & Gas and Geothermal Alternative B





Legend

Fluid Minerals: Closed Fluid Minerals: Open Major Stipulations (NSO) Fluid Minerals: Open Moderate Stipulations (CSU/TL)

Fluid Minerals: Open Standard

Stipulations

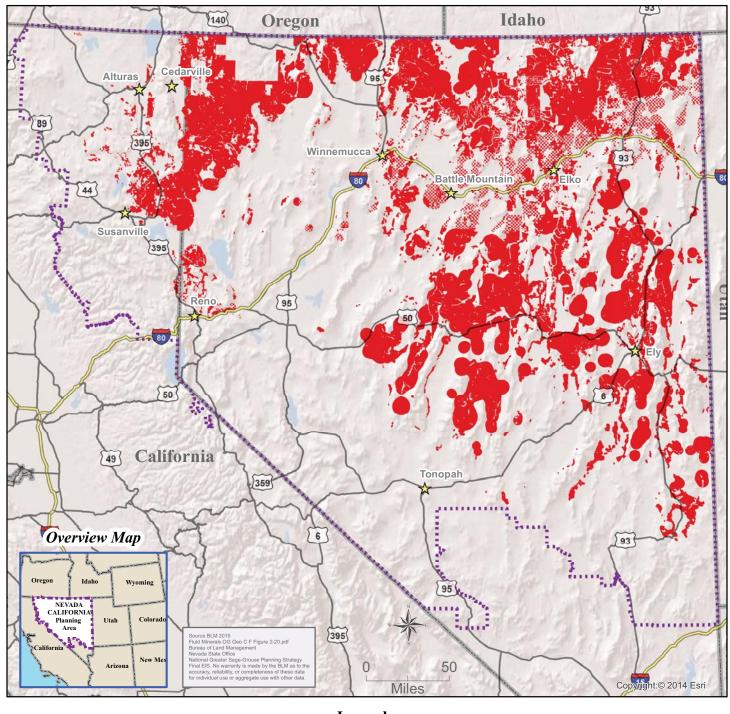
City/Town Interstate US Route





NV-NECA Greater Sage-Grouse Habitat Fluid Minerals Oil & Gas and Geothermal Alternative C & Alternative F





Legend

Fluid Minerals: Closed
Fluid Minerals: Open Major
Stipulations (NSO)
Fluid Minerals: Open Moderate
Stipulations (CSU/TL)

Fluid Minerals: Open Standard Stipulations

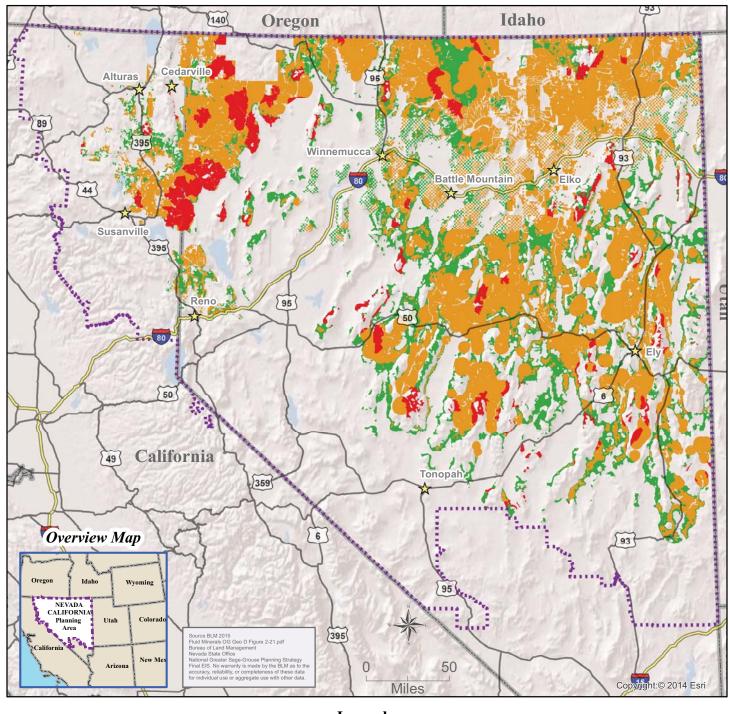
US Route
States
Planning Area

City/Town



NV-NECA Greater Sage-Grouse Habitat Fluid Minerals Oil & Gas and Geothermal Alternative D





Legend

Fluid Minerals: Closed
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Stipulations (NSO)
Fluid Minerals: Open Moderate
Stipulations (CSU/TL)

Fluid Minerals: Open Standard Stipulations

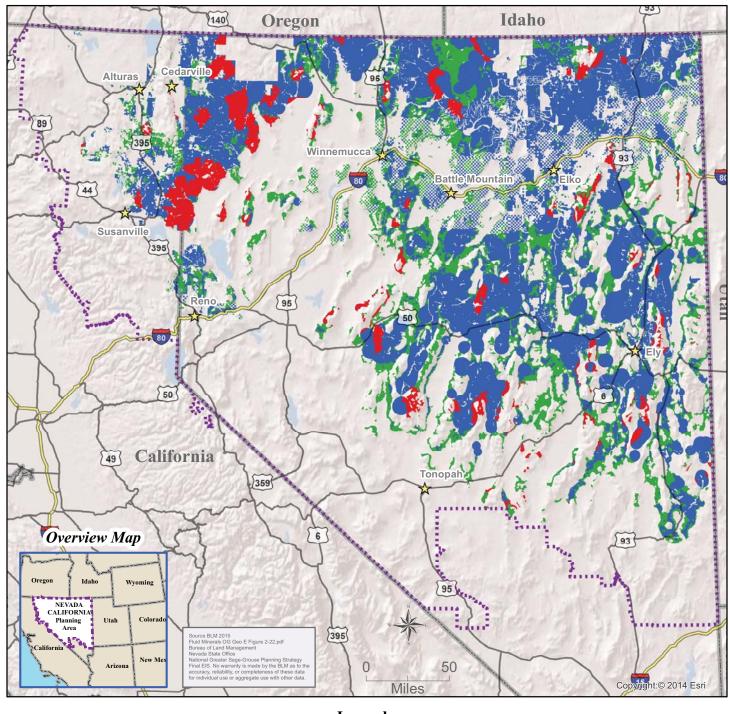
City/Town
Interstate
US Route
States

Planning Area



NV-NECA Greater Sage-Grouse Habitat Fluid Minerals Oil and Gas and Geothermal Alternative E





Legend

Fluid Minerals: Closed
Fluid Minerals: Open Major
Stipulations (NSO)
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Stipulations (CSU/TL)
Fluid Minerals: Open Standard

Stipulations

US Route
States
Planning Area

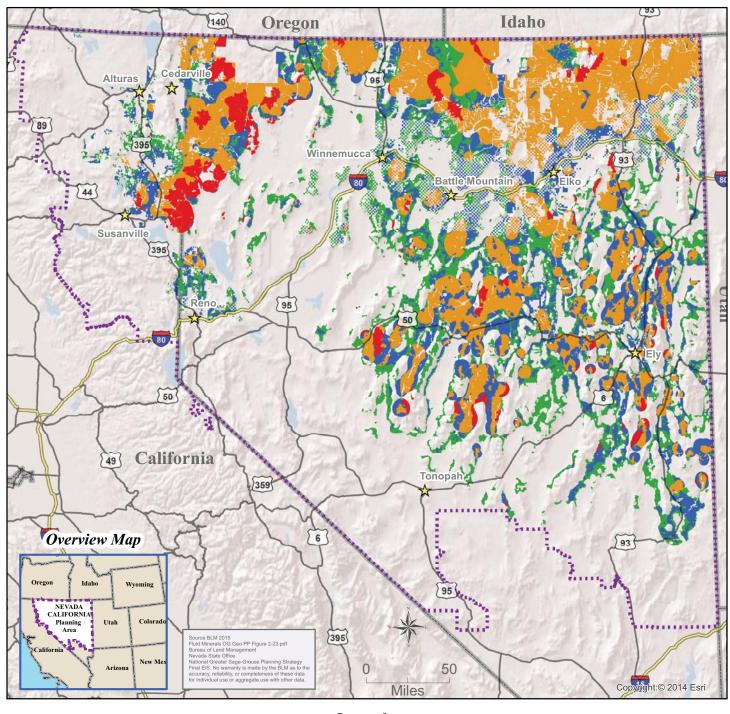
Interstate

City/Town



NV-NECA Greater Sage-Grouse Habitat Fluid Minerals Oil and Gas and Geothermal Proposed Plan





Legend

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Stipulations (NSO)
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Stipulations (CSU/TL)
Fluid Minerals: Open Standard

Stipulations

US Route
States
Planning Area

City/Town

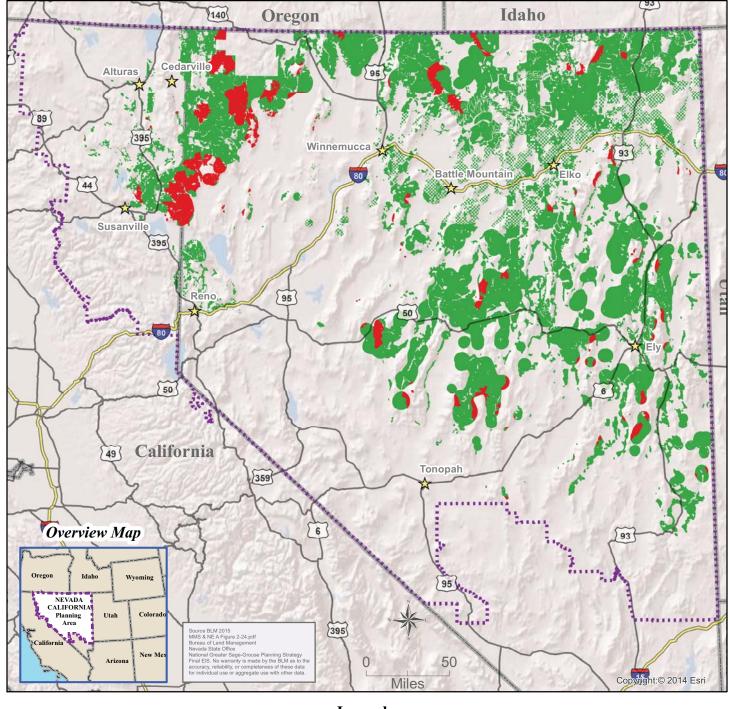
Interstate



NV-NECA Greater Sage-Grouse Habitat







Legend

Mineral Material Sales & Nonenergy Leasables: Closed
Mineral Material Sales & Nonenergy Leasables: Open

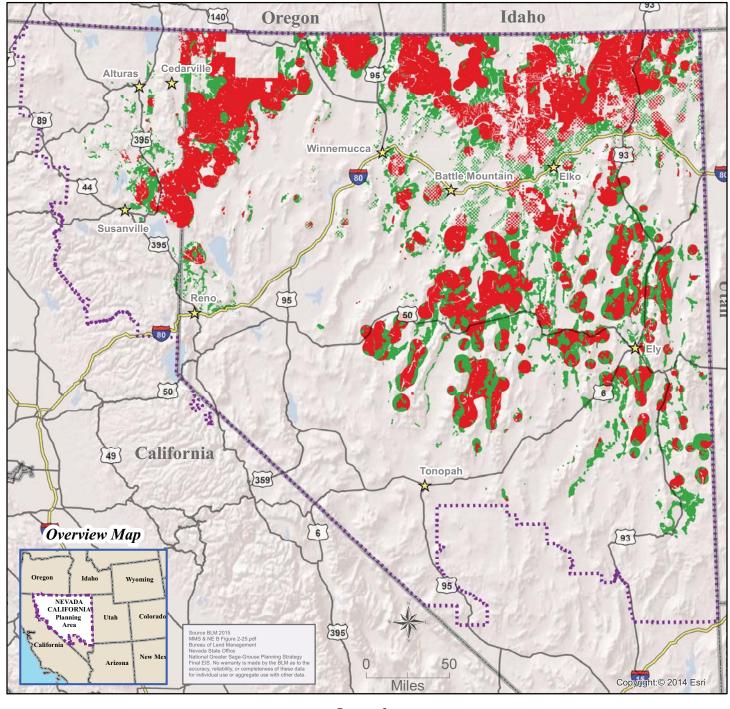




NV-NECA Greater Sage-Grouse Habitat







Legend

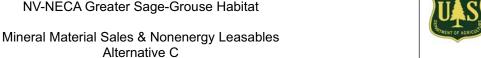
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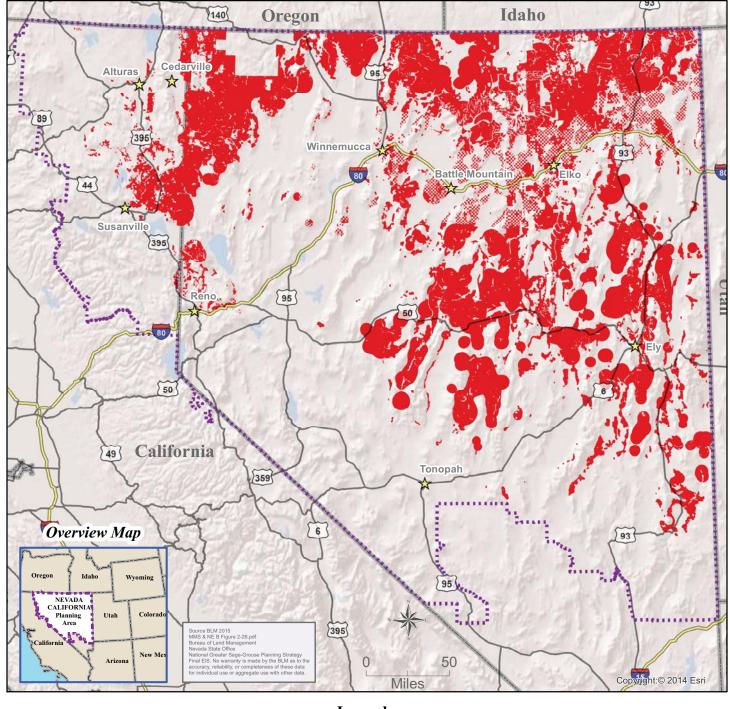
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







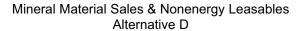
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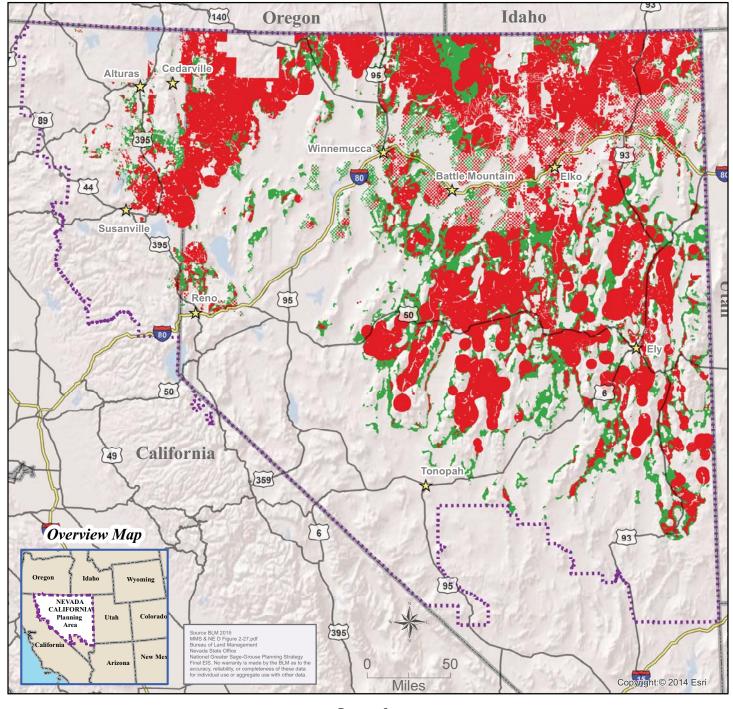




NV-NECA Greater Sage-Grouse Habitat







Legend

Mineral Material Sales & Nonenergy Leasables: Closed
Mineral Material Sales &

Mineral Material Sales & Nonenergy Leasables: Open

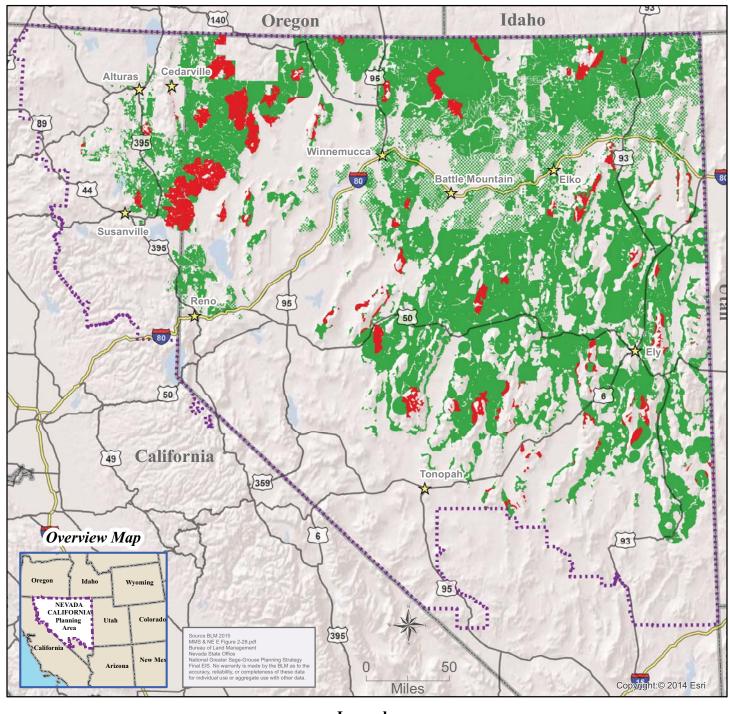




NV-NECA Greater Sage-Grouse Habitat







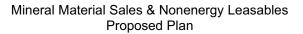
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Mineral Material Sales & Nonenergy Leasables: Open

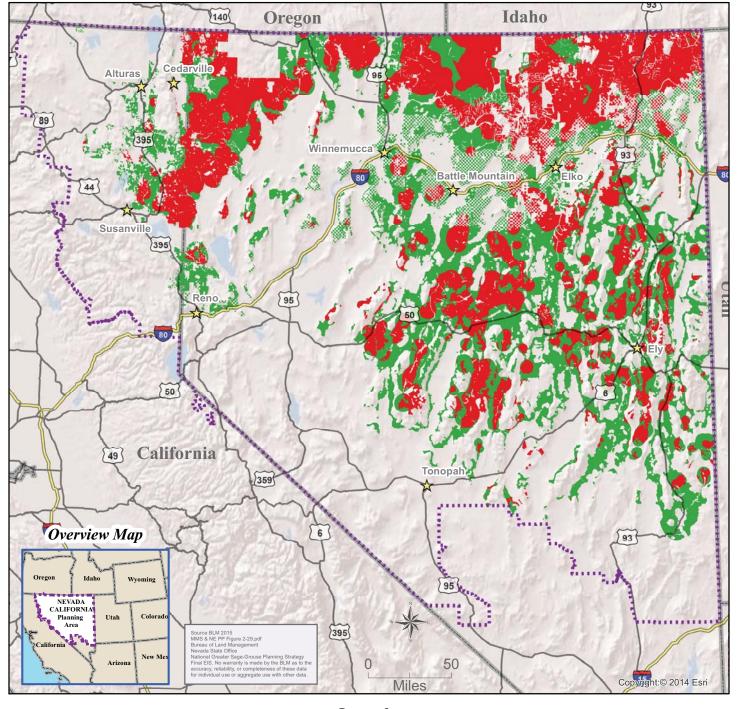
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

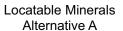
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Mineral Material Sales & Nonenergy Leasables: Open

City/Town

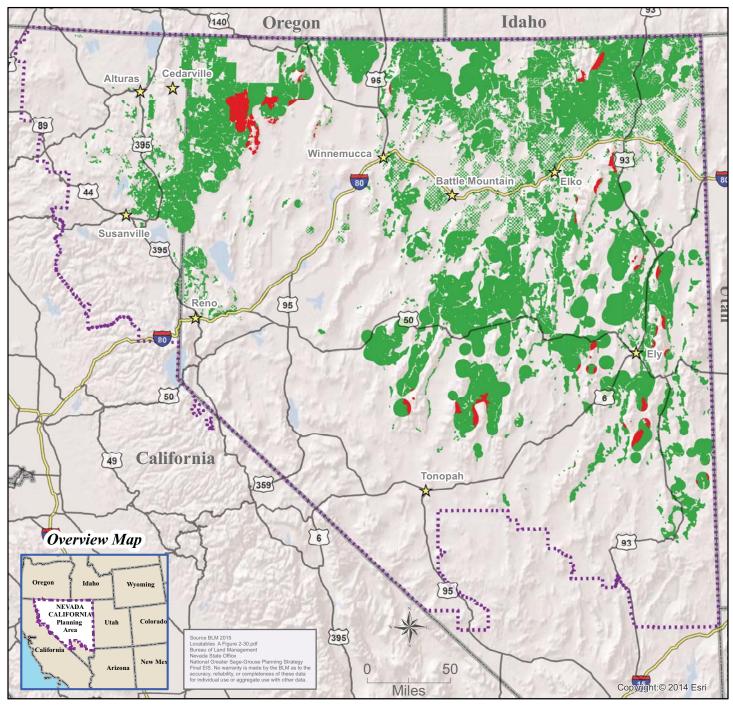
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

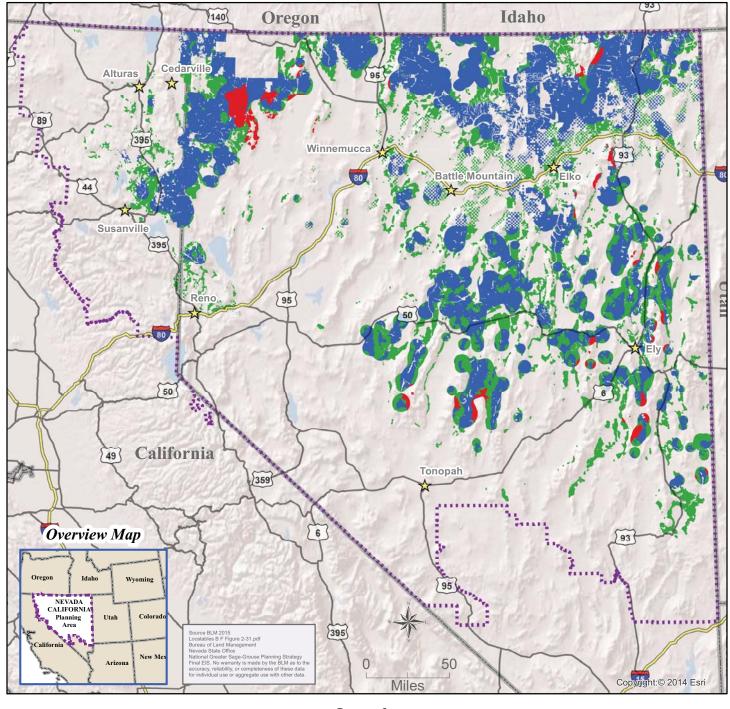




NV-NECA Greater Sage-Grouse Habitat







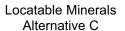
Legend

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Locatables: Recommended Withdrawals
Locatables: Open

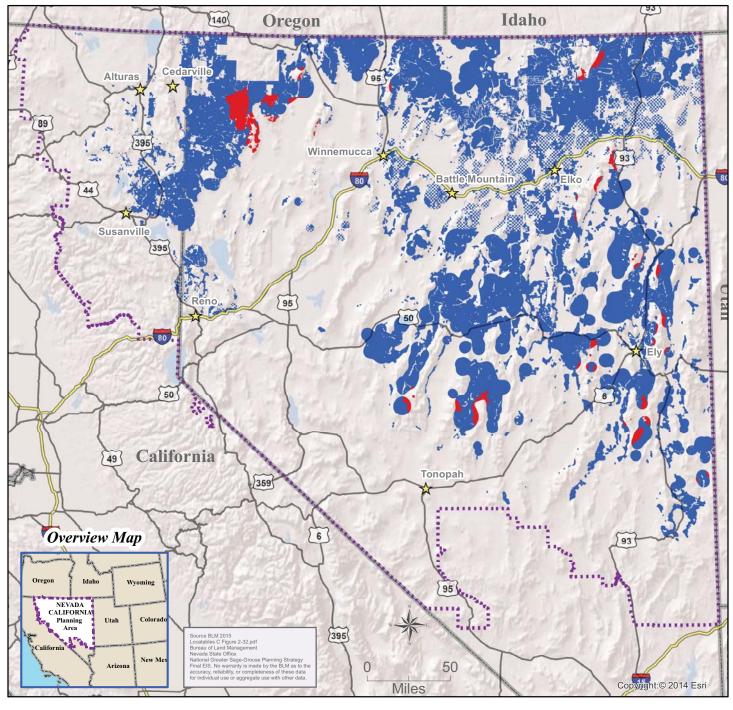
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Locatables: Existing Withdrawals
Locatables: Recommended Withdrawals
Locatables: Open

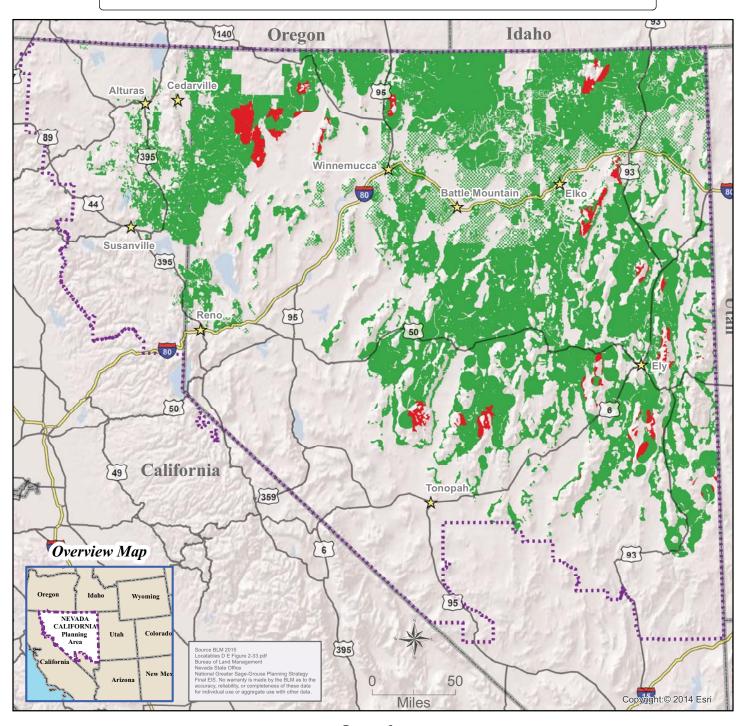
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat



Locatable Minerals
Alternative D & Alternative E



Legend

Locatables: Existing Withdrawals

Locatables: Recommended
Withdrawals

Locatables: Open

City/Town

Interstate

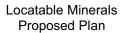
US Route

States

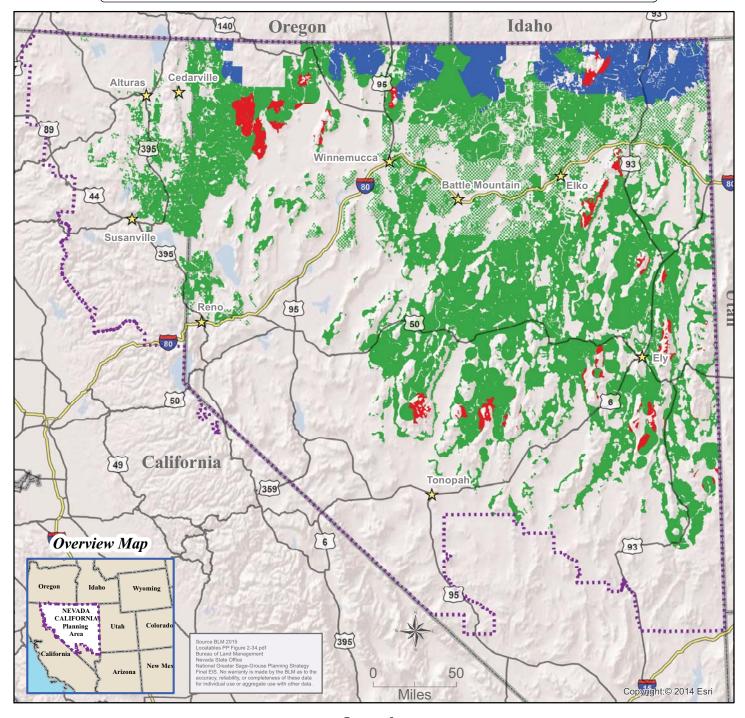
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Locatables: Existing Withdrawals

Locatables: Recommended Withdrawals

Locatables: Open

City/Town

Interstate

US Route

States

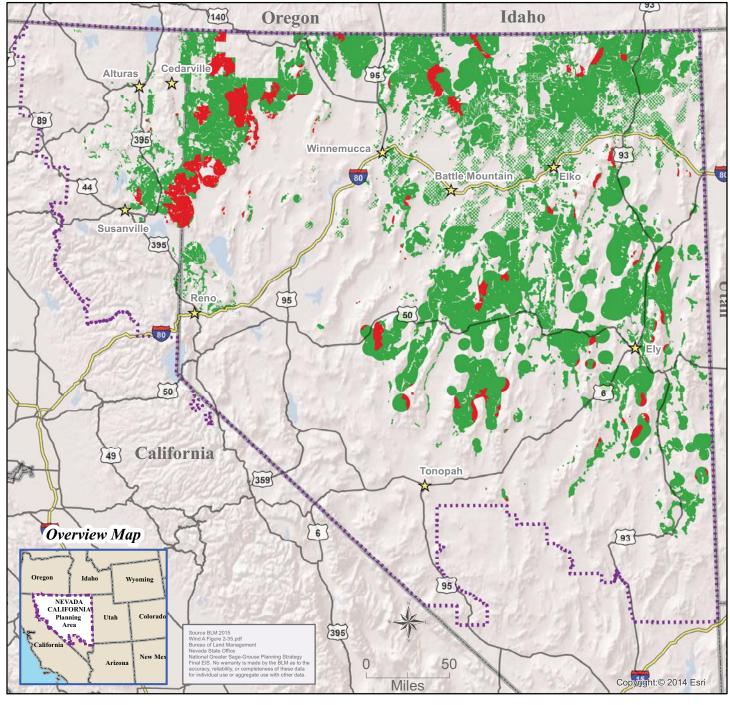
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Interstate

US Route

States Planning Area

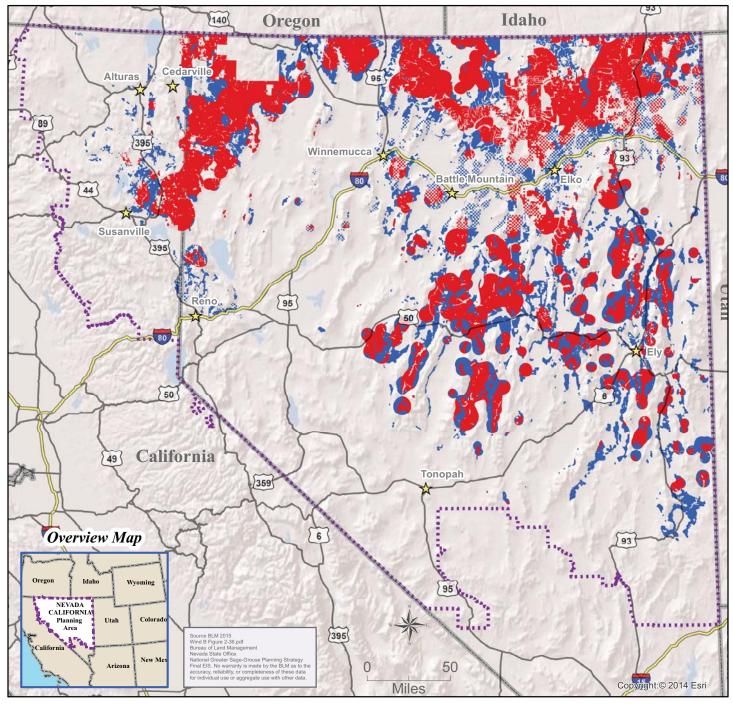
City/Town Wind Energy: Exclusion Wind Energy: Avoidance Wind Energy: Open



NV-NECA Greater Sage-Grouse Habitat







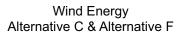
Legend

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Wind Energy: Avoidance
Wind Energy: Open

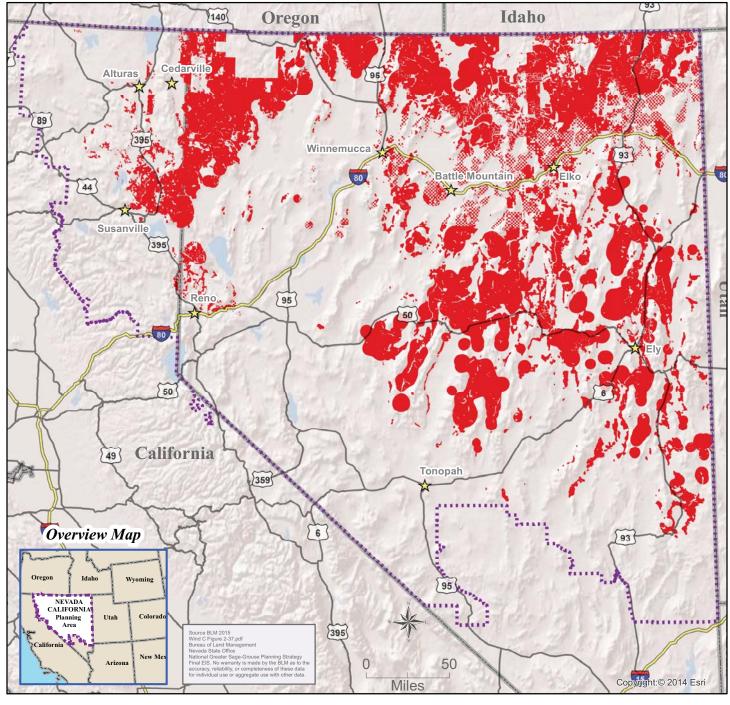




NV-NECA Greater Sage-Grouse Habitat







Legend

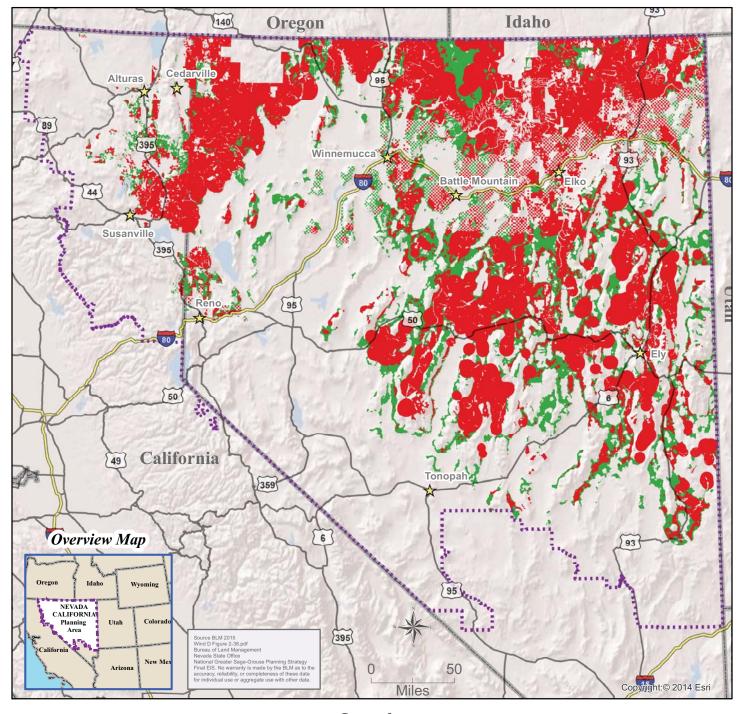
Wind Energy: Exclusion
Wind Energy: Avoidance
Wind Energy: Open
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

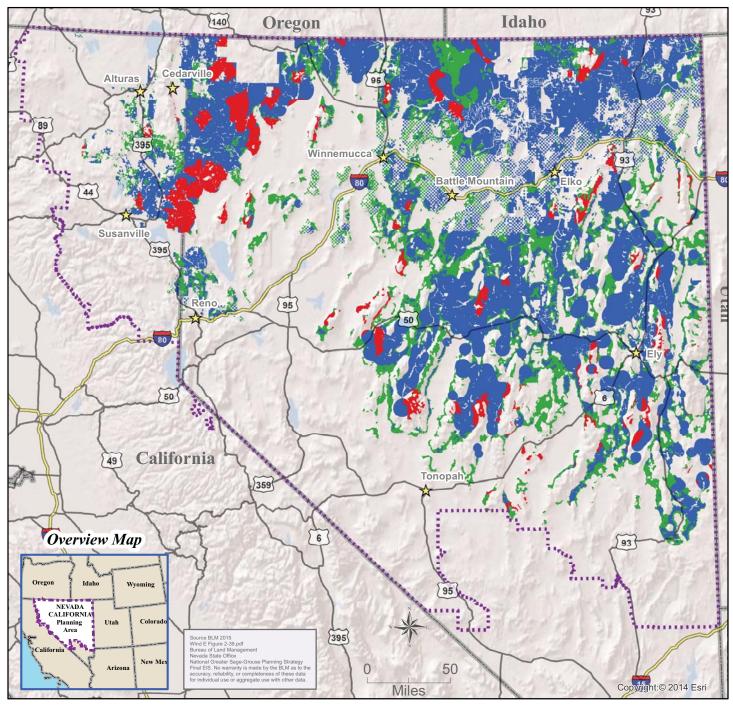
Wind Energy: Exclusion
Wind Energy: Avoidance
Wind Energy: Open
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Wind Energy: Exclusion
Wind Energy: Avoidance
Wind Energy: Open

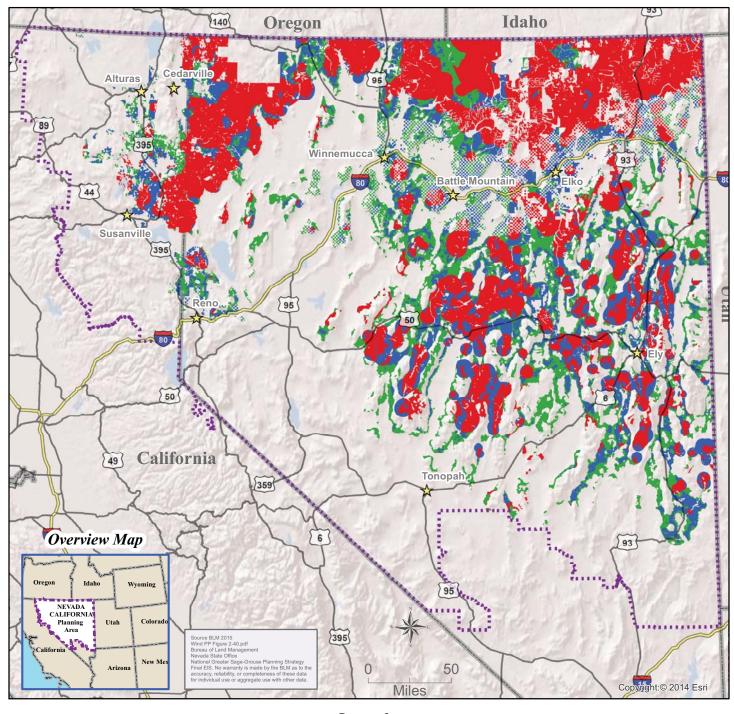
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Wind Energy: Exclusion
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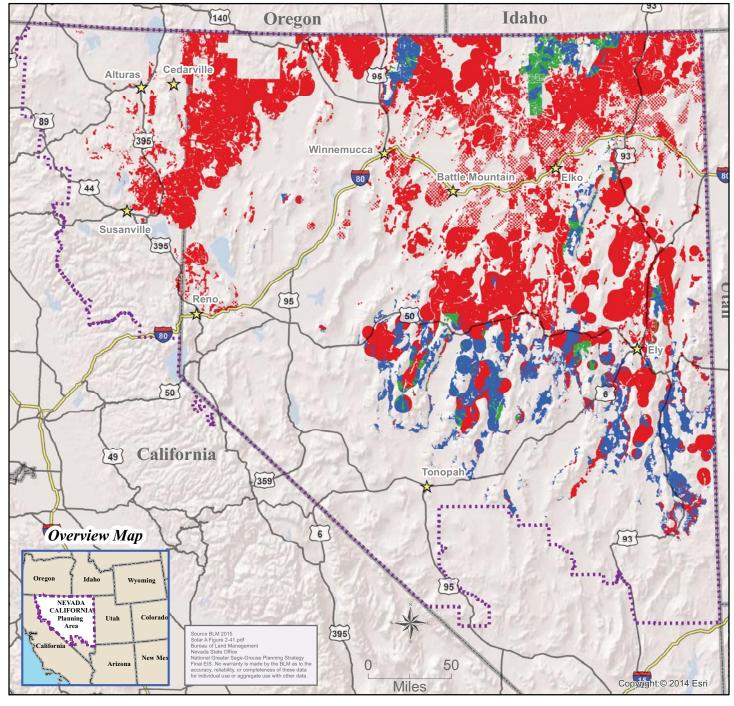
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Solar Energy: Exclusion

Solar Energy: Avoidance

Solar Energy: Open

City/Town

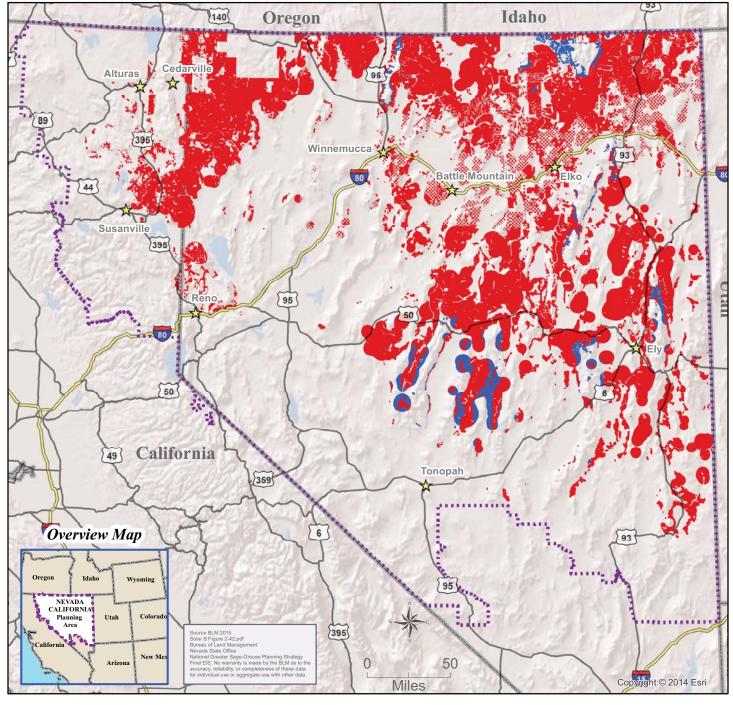
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat





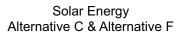


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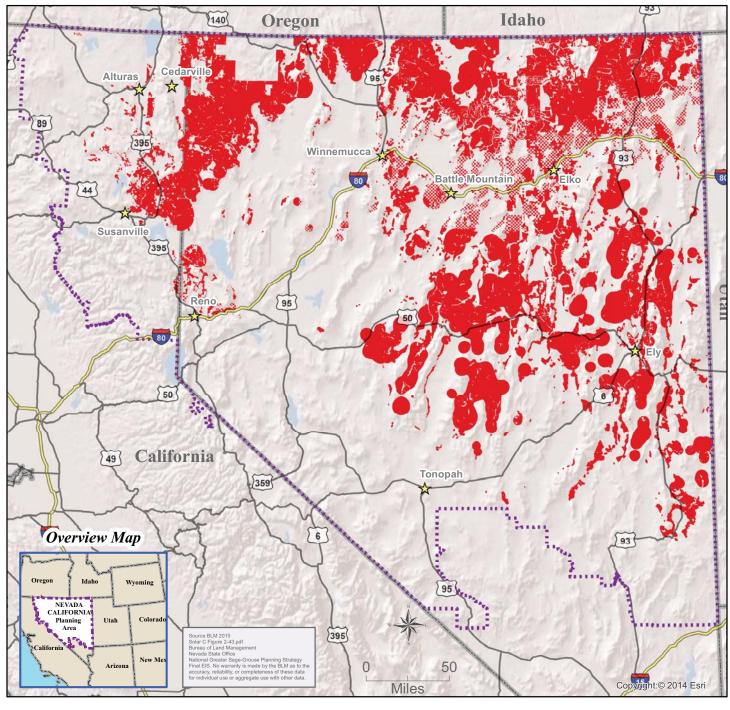
Solar Energy: Exclusion
Solar Energy: Avoidance
Solar Energy: Open
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

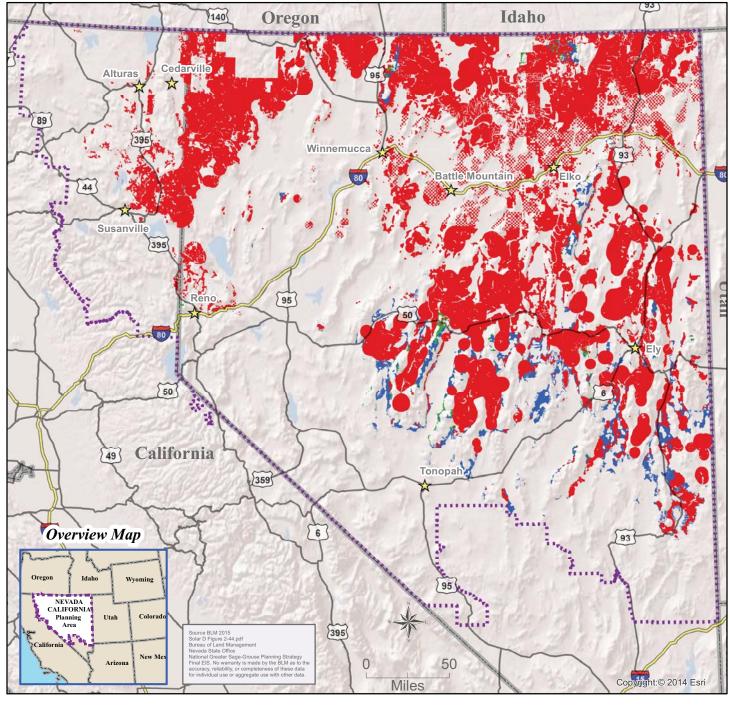
Solar Energy: Exclusion
Solar Energy: Avoidance
US Route
Solar Energy: Open
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

City/Town Solar Energy: Exclusion Solar Energy: Avoidance Solar Energy: Open

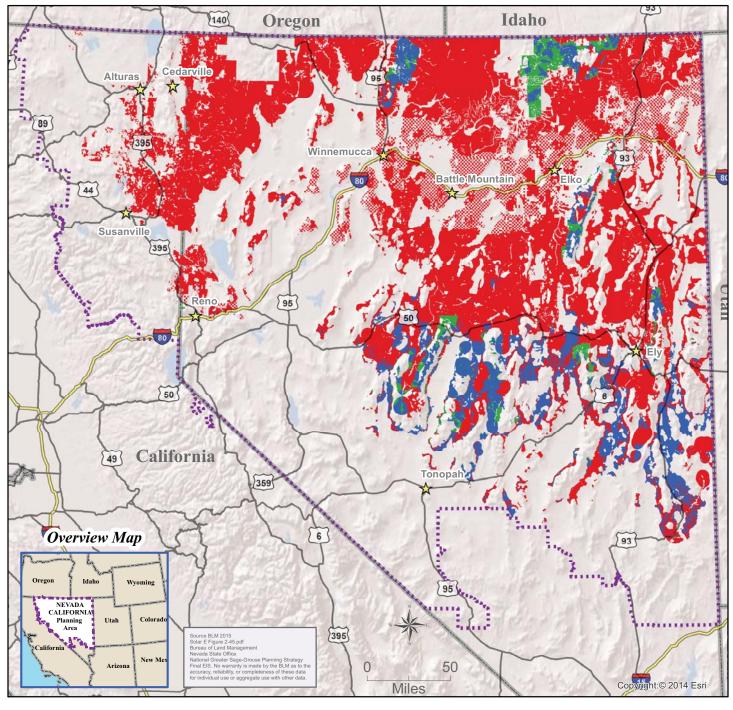




NV-NECA Greater Sage-Grouse Habitat







Legend

Solar Energy: Exclusion

Solar Energy: Avoidance

Solar Energy: Open

City/Town

Interstate

US Route

States

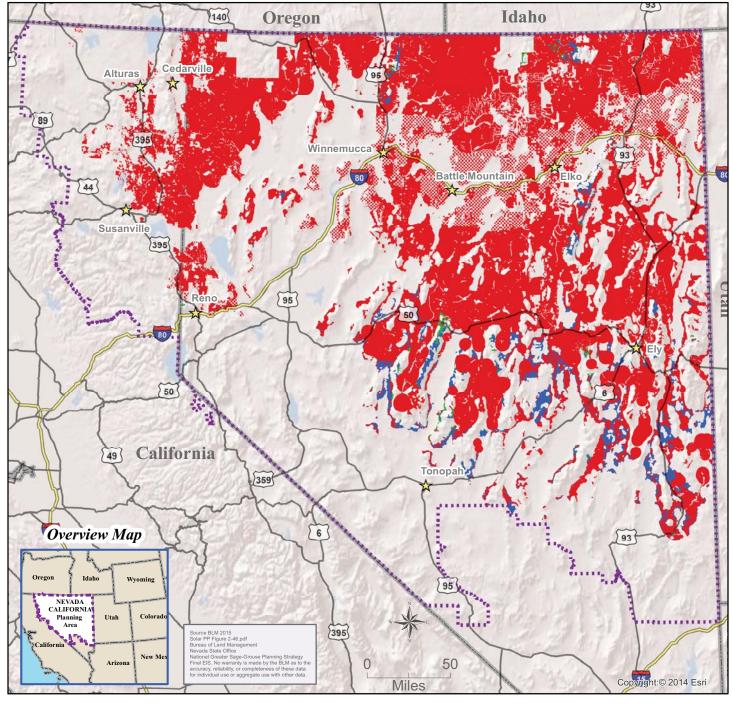
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Solar Energy: Exclusion

Solar Energy: Avoidance

Solar Energy: Open

City/Town

Interstate

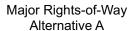
US Route

States

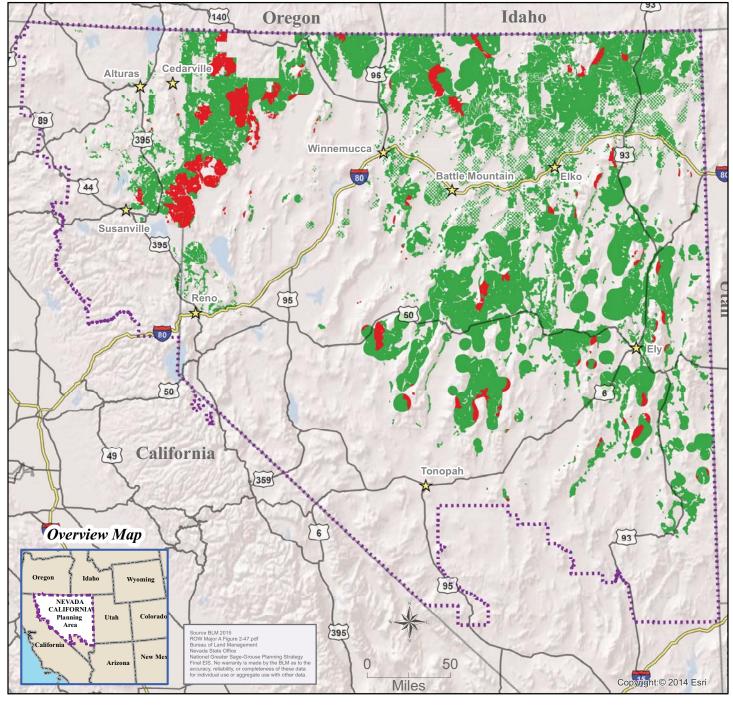
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Major ROW:

Major ROW:

Major ROW:

Major ROW:

Major ROW: Open

City/Town

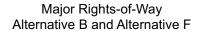
US Route

States

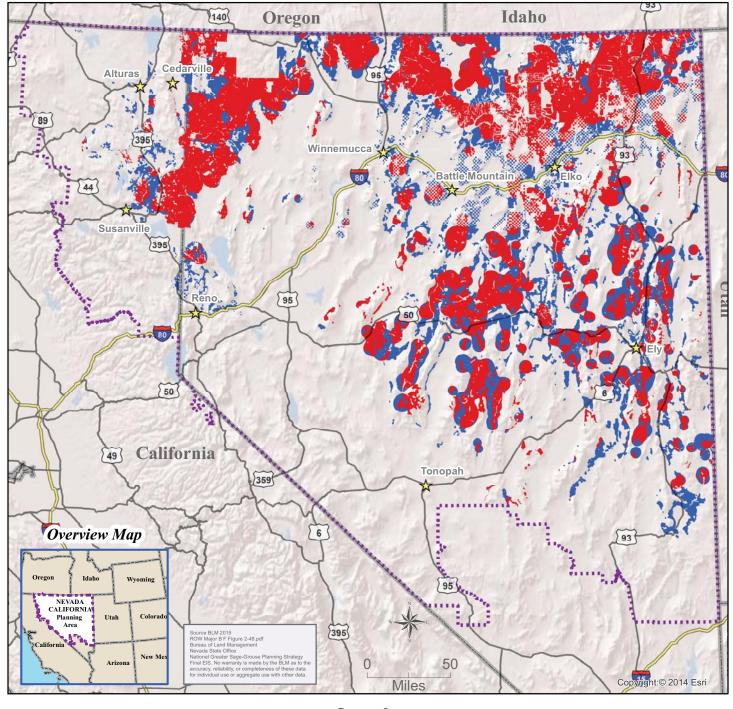
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Major ROW: Exclusion

Major ROW:

Major ROW:

Major ROW: Open

City/Town

Interstate

US Route

States

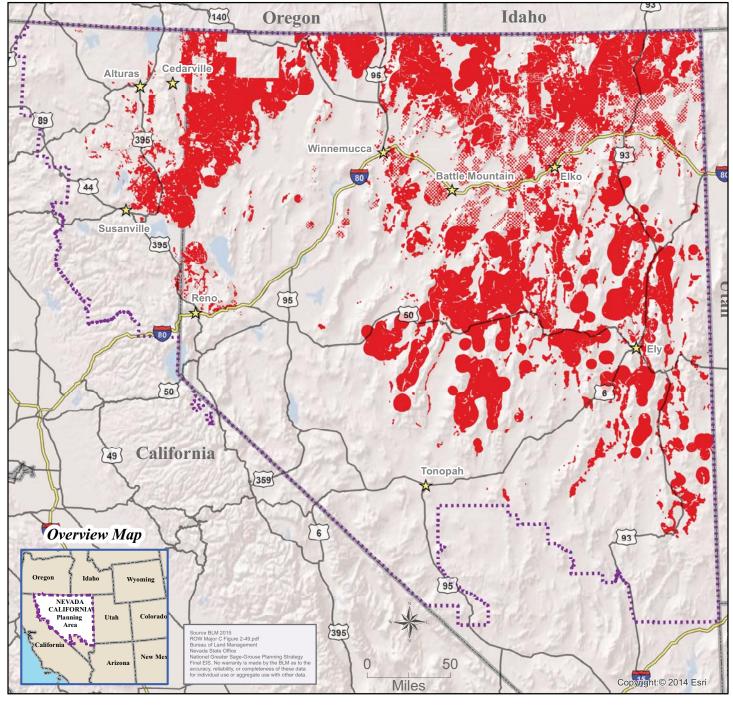
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Major ROW: Exclusion
Major ROW:
Major ROW: Open

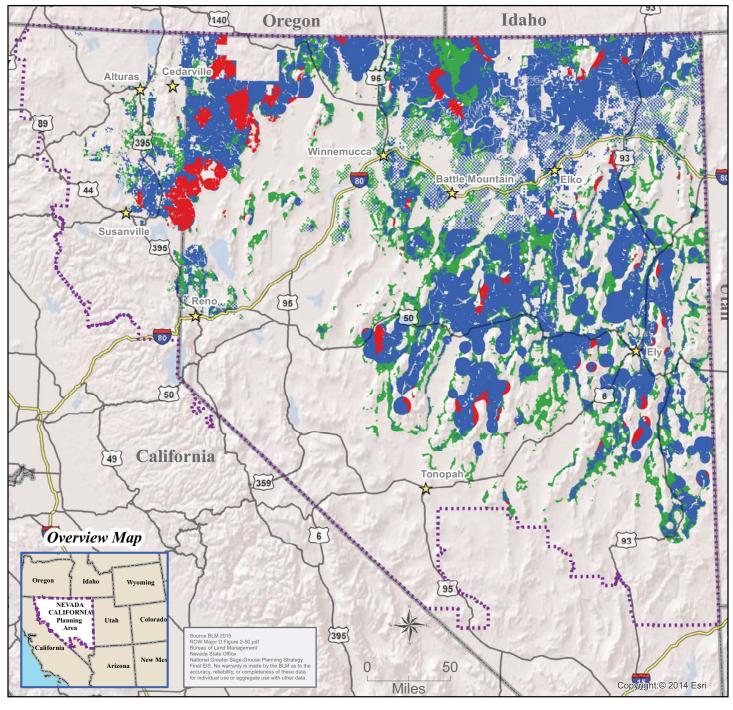




NV-NECA Greater Sage-Grouse Habitat







Legend

Major ROW: Exclusion

Major ROW: Avoidance

Major ROW: Open

City/Town

Interstate

US Route

States

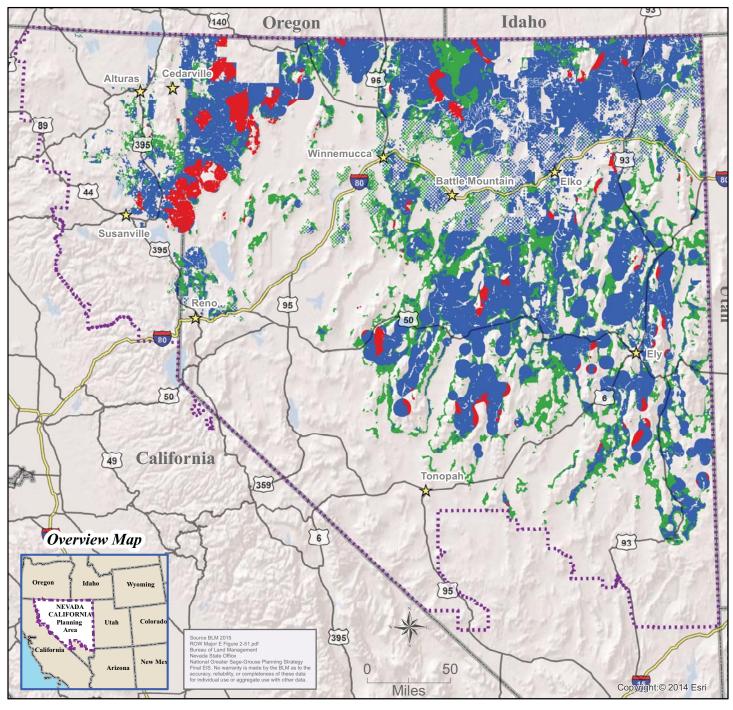
Planning Area



NV-NECA Greater Sage-Grouse Habitat







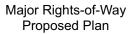
Legend

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Major ROW: Open

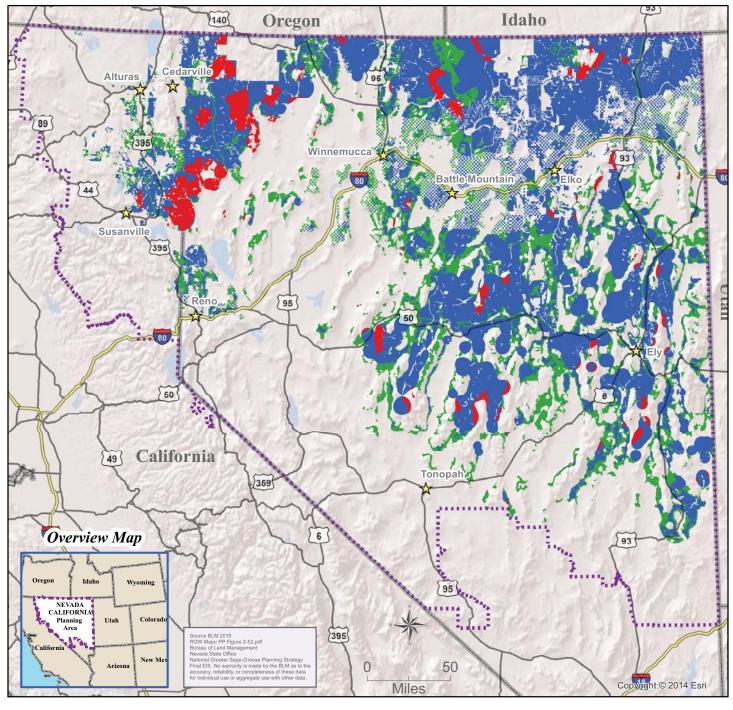
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







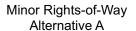
Legend

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Major ROW: Avoidance
Major ROW: Open

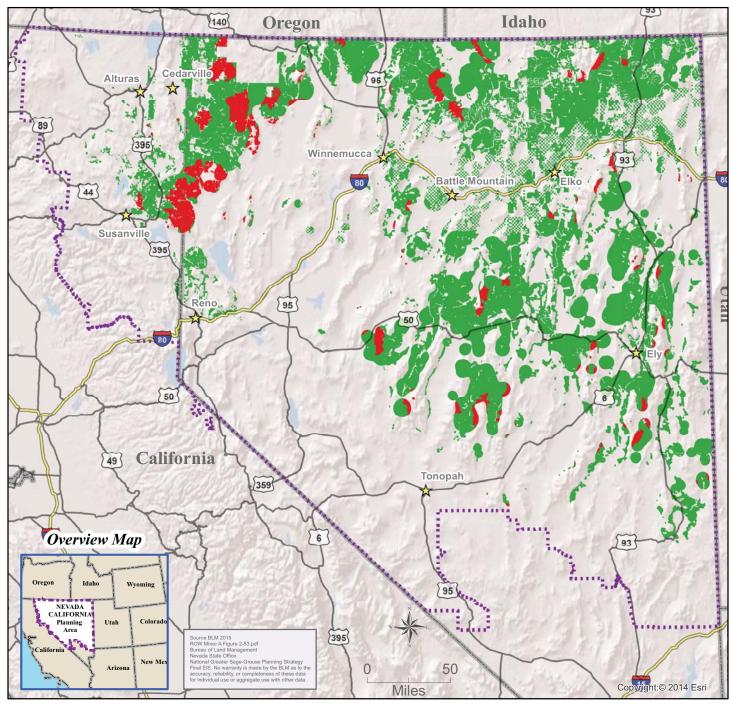
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

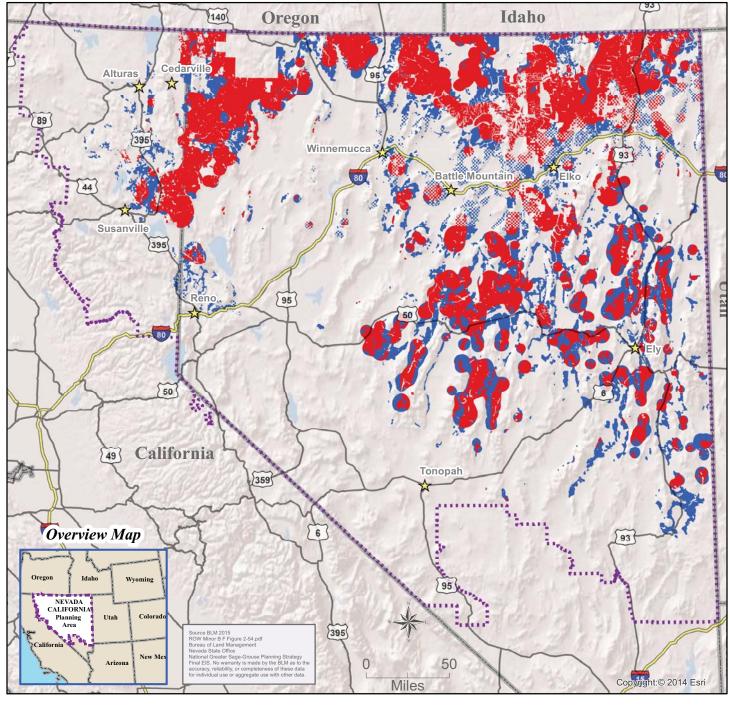




NV-NECA Greater Sage-Grouse Habitat







Legend

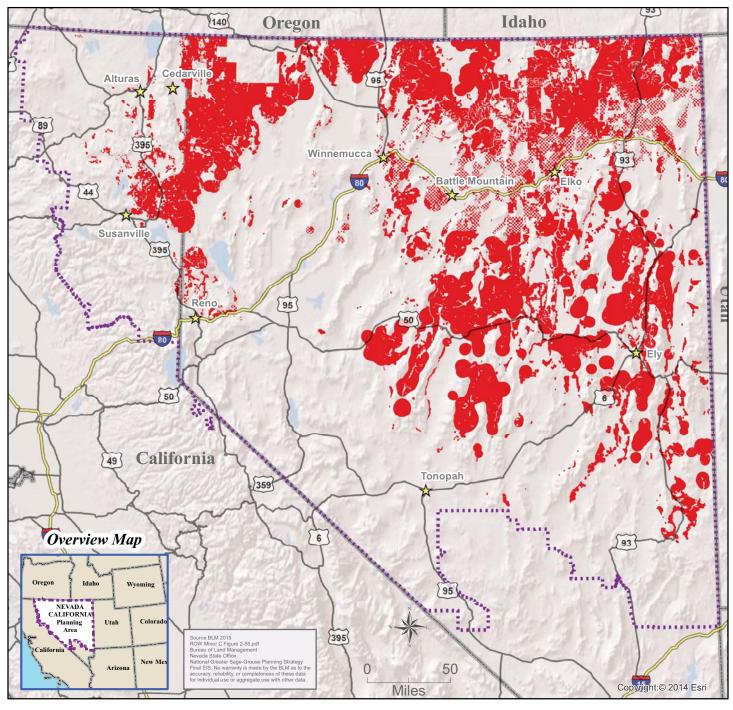




NV-NECA Greater Sage-Grouse Habitat







Legend

Minor ROW: Exclusion
Minor ROW: Avoidance
Minor ROW: Open

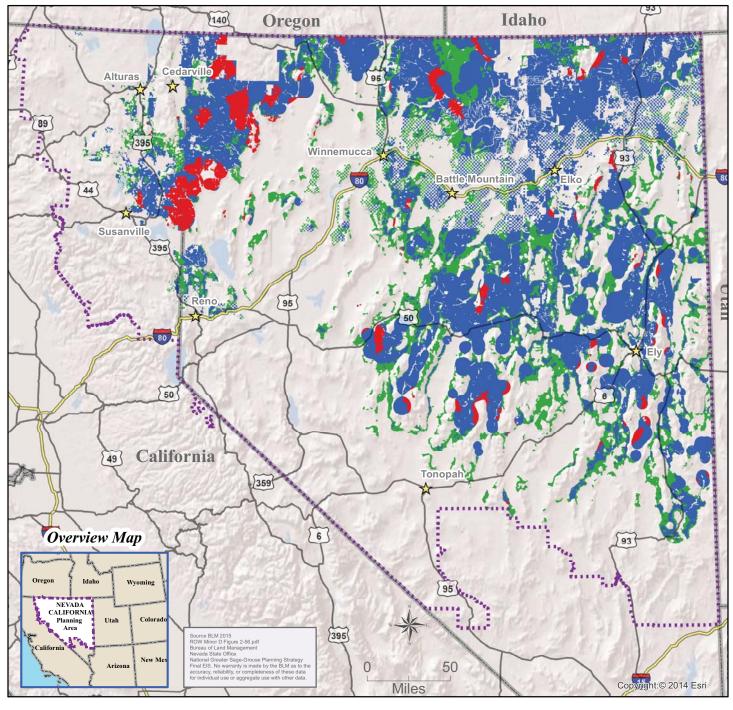
City/Town
Interstate
US Route
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Minor ROW: Exclusion
Minor ROW: Avoidance
Minor ROW: Open

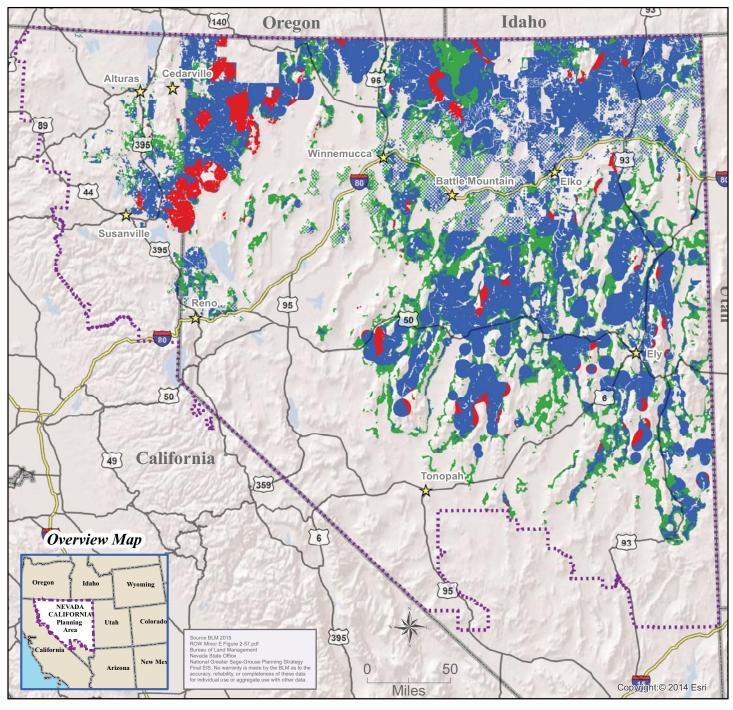




NV-NECA Greater Sage-Grouse Habitat







Legend

Minor ROW: Exclusion

Minor ROW: Avoidance

Minor ROW: Open

City/Town

Interstate

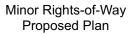
US Route

States

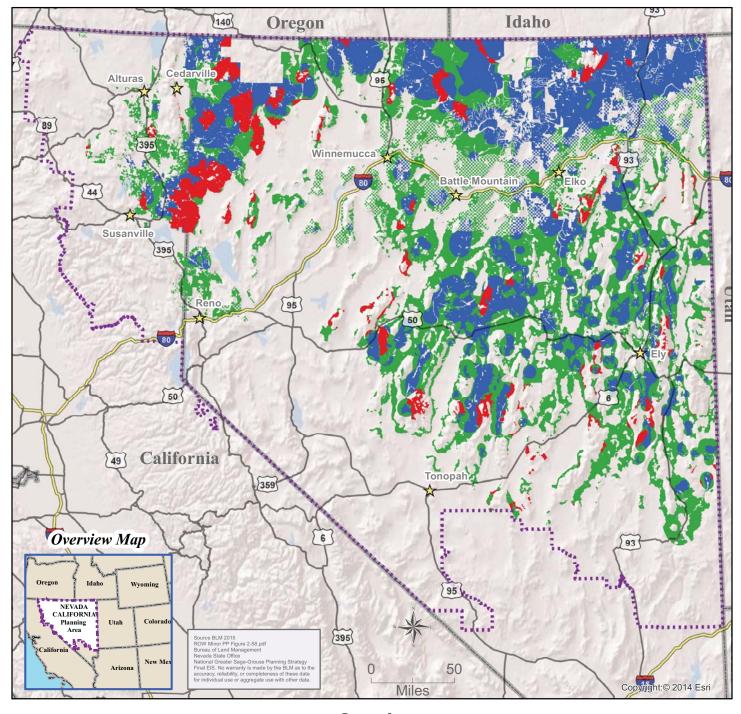
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Minor ROW: Exclusion

Minor ROW: Avoidance

Minor ROW: Open

City/Town

Interstate

US Route

States

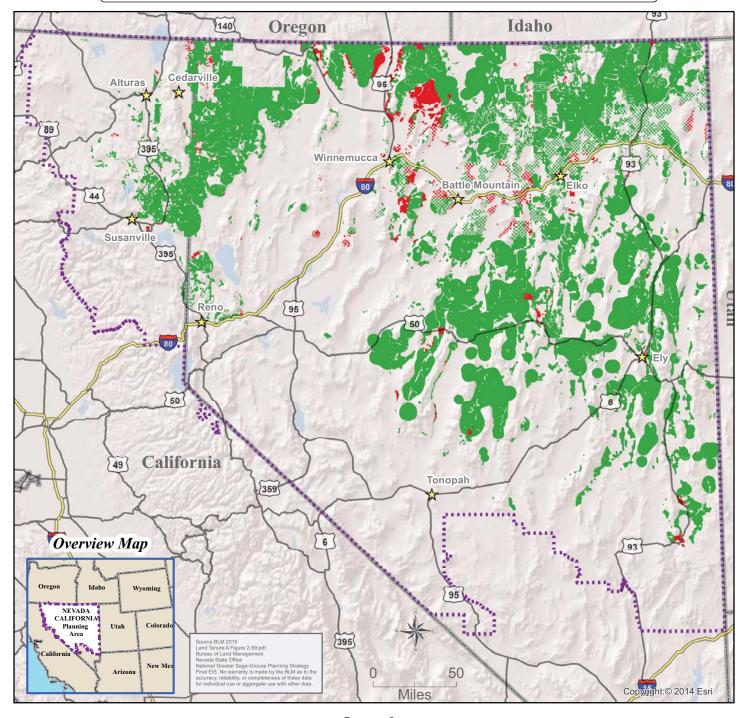
Planning Area



NV-NECA Greater Sage-Grouse Habitat





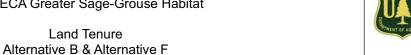


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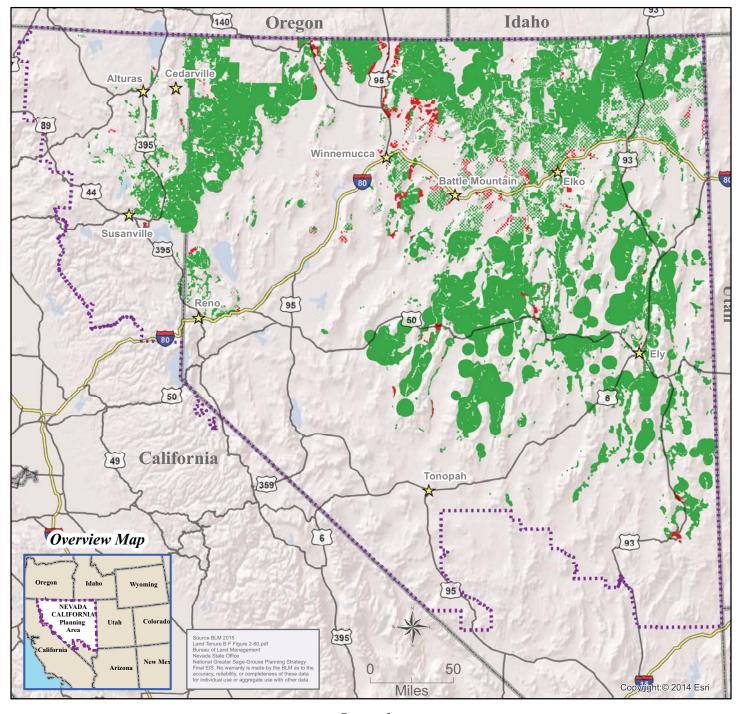
City/Town
Interstate
US Route
Land Tenure: Retention
States
Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

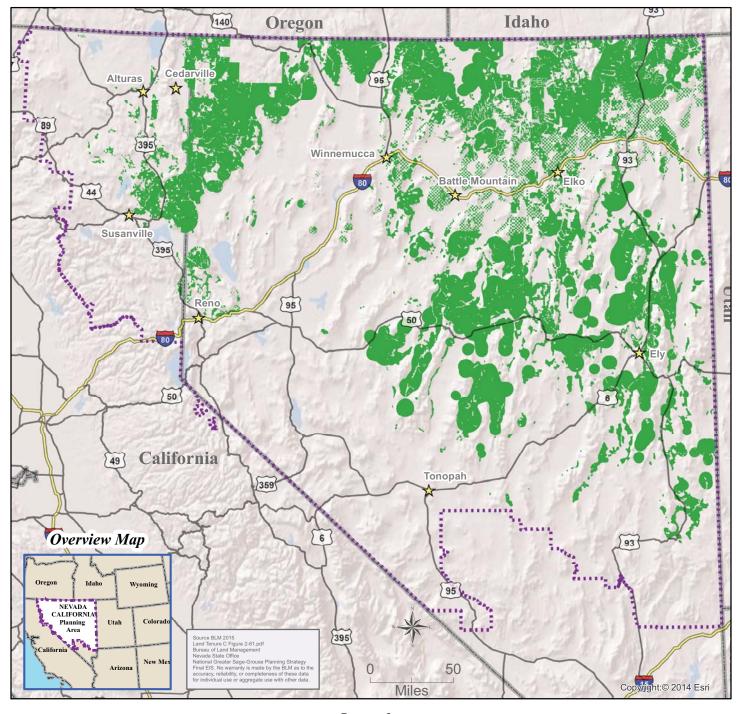
City/Town Interstate Land Tenure: Disposal US Route Land Tenure: Retention States Planning Area



NV-NECA Greater Sage-Grouse Habitat







Legend

Land Tenure: Disposal
Land Tenure: Retention

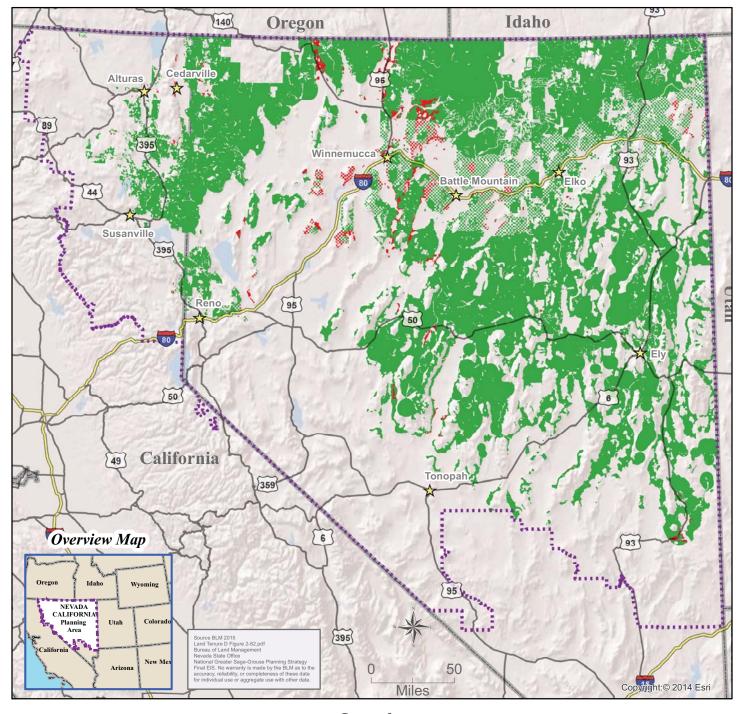




NV-NECA Greater Sage-Grouse Habitat







Legend

Land Tenure: Disposal
Land Tenure: Retention

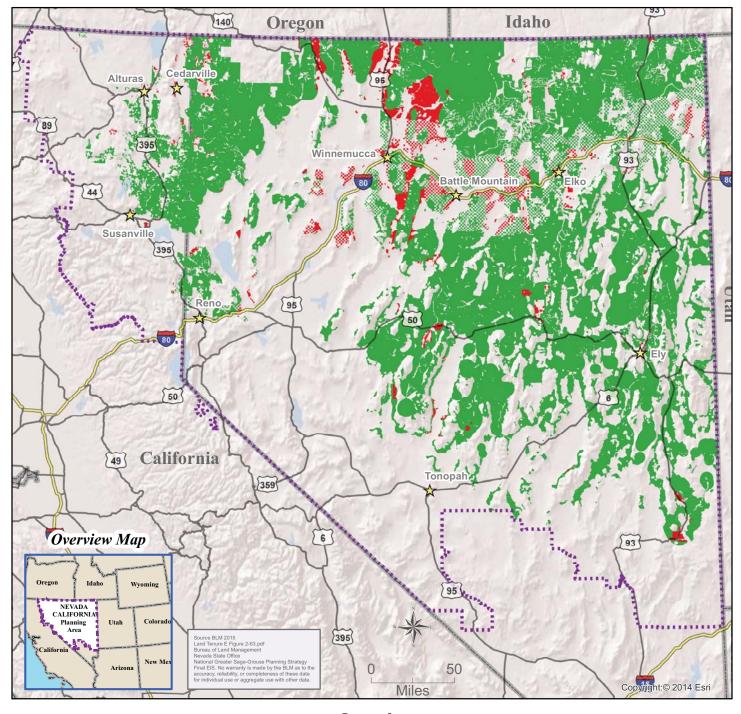




NV-NECA Greater Sage-Grouse Habitat







Legend

Land Tenure: Disposal
Land Tenure: Retention

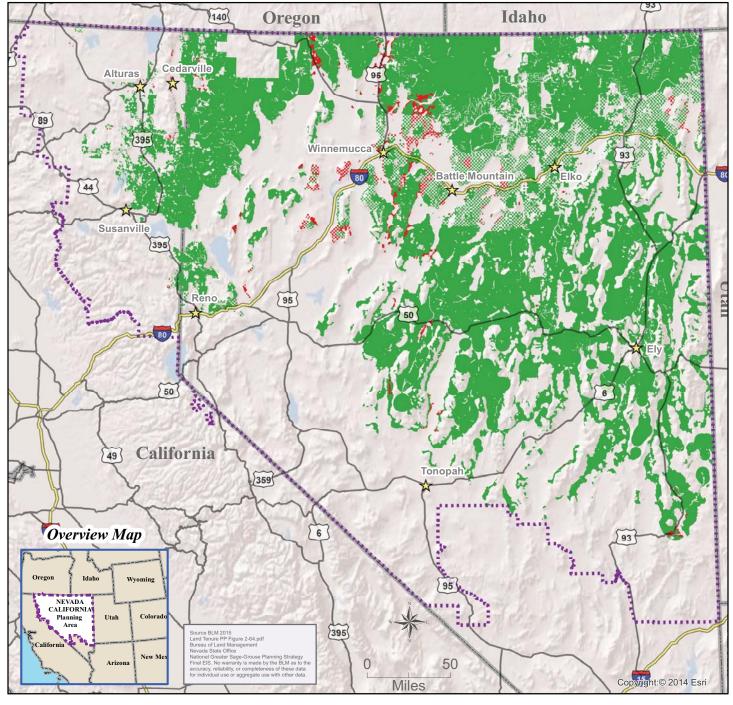




NV-NECA Greater Sage-Grouse Habitat





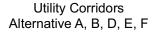


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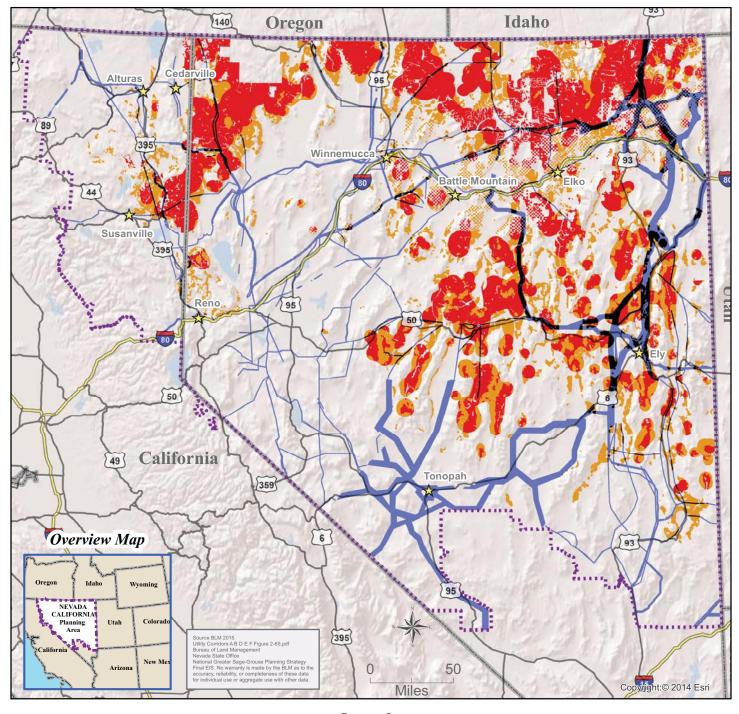
City/Town
Interstate
US Route
Land Tenure: Retention
States
Planning Area



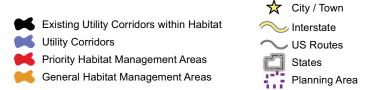
NV-NECA Greater Sage-Grouse Habitat







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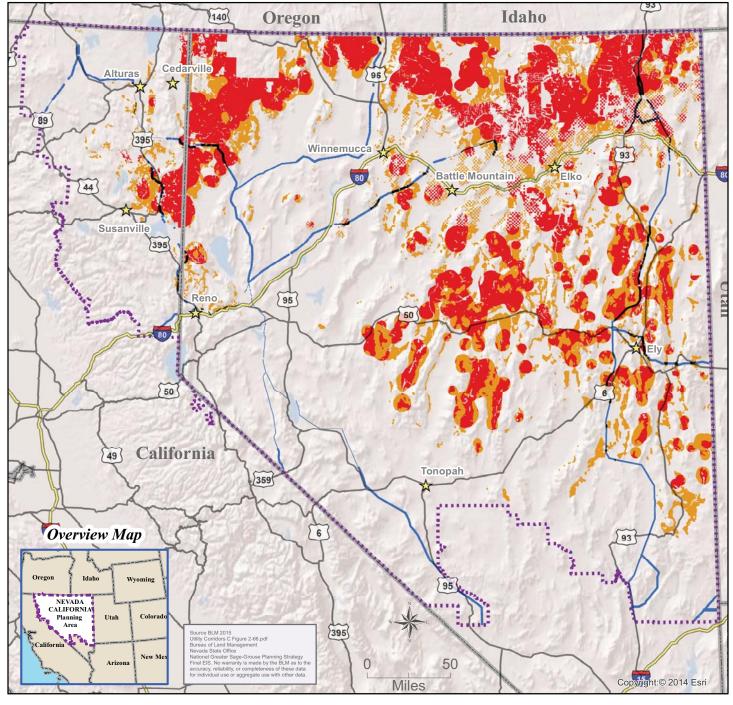




NV-NECA Greater Sage-Grouse Habitat





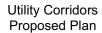


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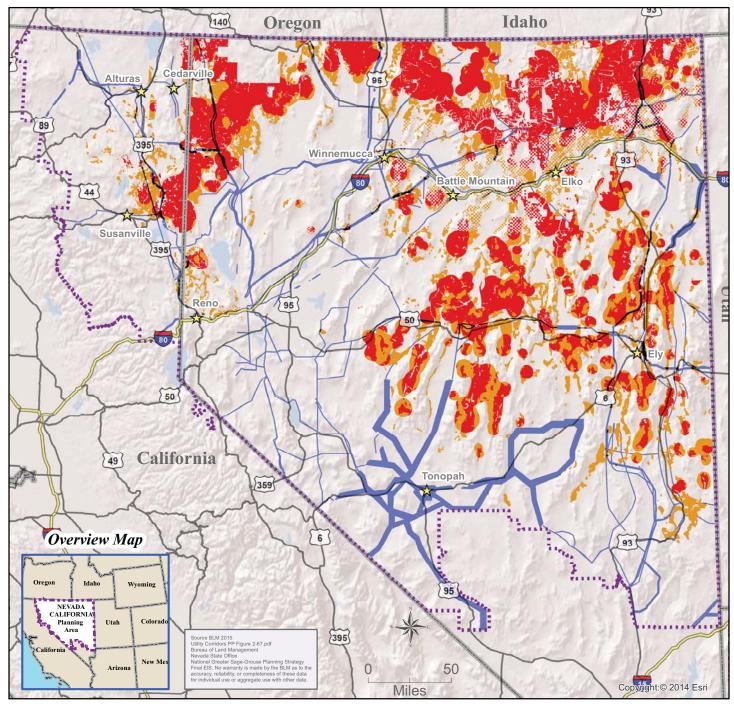




NV-NECA Greater Sage-Grouse Habitat

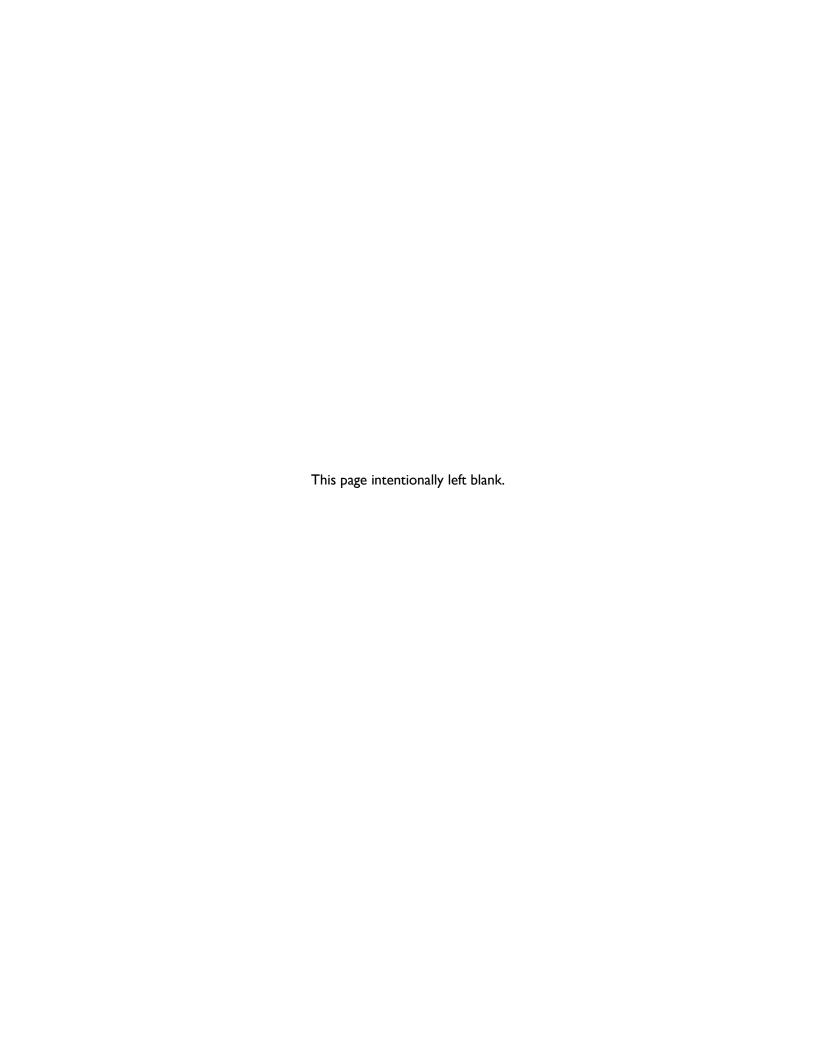






Legend





Appendix I

Regional Mitigation Strategy

APPENDIX I REGIONAL MITIGATION STRATEGY

GENERAL

In undertaking BLM/Forest Service management actions, and, consistent with valid existing rights and applicable law, in authorizing third party actions that result in habitat loss and degradation, the BLM/USFS will require and ensure mitigation that provides a net conservation gain to the species including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions. Mitigation will follow the regulations from the White House Council on Environmental Quality (CEQ) (40 CFR 1508.20; e.g. avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy. If impacts from BLM/Forest Service management actions and authorized third party actions that result in habitat loss and degradation remain after applying avoidance and minimization measures (i.e. residual impacts), then compensatory mitigation projects will be used to provide a net conservation gain to the species Any compensatory mitigation will be durable, timely, and in addition to that which would have resulted without the compensatory mitigation (see glossary).

The BLM/Forest Service, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy that will inform the NEPA decision making process including the application of the mitigation hierarchy for BLM/USFS management actions and third party actions that result in habitat loss and degradation. A robust and transparent Regional Mitigation Strategy will contribute to Greater Sage-Grouse habitat conservation by reducing, eliminating, or minimizing threats and compensating for residual impacts to Greater Sage-Grouse and its habitat.

The BLM's Regional Mitigation Manual MS-1794 serves as a framework for developing and implementing a Regional Mitigation Strategy. The following

sections provide additional guidance specific to the development and implementation of a WAFWA Management Zone Regional Mitigation Strategy.

DEVELOPING A WAFWA MANAGEMENT ZONE REGIONAL MITIGATION STRATEGY

The BLM/Forest Service, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy to guide the application of the mitigation hierarchy for BLM/USFS management actions and third party actions that result in habitat loss and degradation. The Strategy should consider any State-level Greater Sage-Grouse mitigation guidance that is consistent with the requirements identified in this Appendix. The Regional Mitigation Strategy should be developed in a transparent manner, based on the best science available and standardized metrics.

As described in Chapter 2, the BLM/Forest Service will establish a WAFWA Management Zone Greater Sage-Grouse Conservation Team (hereafter, Team) to help guide the conservation of Greater Sage-Grouse, within 90 days of the issuance of the Record of Decision. The Strategy will be developed within one year of the issuance of the Record of Decision.

The Regional Mitigation Strategy should include mitigation guidance on avoidance, minimization, and compensation, as follows:

Avoidance

- Include avoidance areas (e.g. right-of-way avoidance/exclusion areas, no surface occupancy areas) already included in laws, regulations, policies, and/or land use plans (e.g., Resource Management Plans, Forest Plans, State Plans); and,
- Include any potential, additional avoidance actions (e.g. additional avoidance best management practices) with regard to Greater Sage-Grouse conservation.

Minimization

- Include minimization actions (e.g. required design features, best management practices) already included in laws, regulations, policies, land use plans, and/or land-use authorizations; and,
- Include any potential, additional minimization actions (e.g. additional minimization best management practices) with regard to Greater Sage-Grouse conservation.

Compensation

 Include discussion of impact/project valuation, compensatory mitigation options, siting, compensatory project types and costs, monitoring, reporting, and program administration. Each of these topics is discussed in more detail below.

- Residual Impact and Compensatory Mitigation Project Valuation Guidance
 - A common standardized method should be identified for estimating the value of the residual impacts and value of the compensatory mitigation projects, including accounting for any uncertainty associated with the effectiveness of the projects.
 - This method should consider the quality of habitat, scarcity of the habitat, and the size of the impact/project.
 - For compensatory mitigation projects, consideration of durability (see glossary), timeliness (see glossary), and the potential for failure (e.g. uncertainty associated with effectiveness) may require an upward adjustment of the valuation.
 - The resultant compensatory mitigation project will, after application of the above guidance, result in proactive conservation measures for Greater Sagegrouse (consistent with BLM Manual 6840 – Special Status Species Management, section .02).
- Compensatory Mitigation Options
 - Options for implementing compensatory mitigation should be identified, such as:
 - Utilizing certified mitigation/conservation bank or credit exchanges.
 - Contributing to an existing mitigation/conservation fund.
 - Authorized-user conducted mitigation projects.
 - For any compensatory mitigation project, the investment must be additional (i.e., additionality: the conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project).
- Compensatory Mitigation Siting
 - Sites should be in areas that have the potential to yield a net conservation gain to the Greater Sage-Grouse, regardless of land ownership.
 - Sites should be durable (see glossary).

Sites identified by existing plans and strategies (e.g. fire restoration plans, invasive species strategies, healthy land focal areas) should be considered, if those sites have the potential to yield a net conservation gain to Greater Sage-Grouse and are durable.

Compensatory Mitigation Project Types and Costs

- Project types should be identified that help reduce threats to Greater Sage-Grouse (e.g. protection, conservation, and restoration projects).
- Each project type should have a goal and measurable objectives.
- Each project type should have associated monitoring and maintenance requirements, for the duration of the impact.
- To inform contributions to a mitigation/conservation fund, expected costs for these project types (and their monitoring and maintenance), within the WAFWA Management Zone, should be identified.
- Compensatory Mitigation Compliance and Monitoring
 - Mitigation projects should be inspected to ensure they are implemented as designed, and if not, there should be methods to enforce compliance.
 - Mitigation projects should be monitored to ensure that the goals and objectives are met and that the benefits are effective for the duration of the impact.
- Compensatory Mitigation Reporting
 - Standardized, transparent, scalable, and scientificallydefensible reporting requirements should be identified for mitigation projects.
 - Reports should be compiled, summarized, and reviewed in the WAFWA Management Zone in order to determine if Greater Sage-Grouse conservation has been achieved and/or to support adaptive management recommendations.
- Compensatory Mitigation Program Implementation Guidelines
 - o Guidelines for implementing the State-level compensatory mitigation program should include

holding and applying compensatory mitigation funds, operating a transparent and credible accounting system, certifying mitigation credits, and managing reporting requirements.

INCORPORATING THE REGIONAL MITIGATION STRATEGY INTO NEPA ANALYSES

The BLM/Forest Service will include the avoidance, minimization, and compensatory recommendations from the Regional Mitigation Strategy in one or more of the NEPA analysis' alternatives for BLM/Forest Service management actions and third party actions that result in habitat loss and degradation and the appropriate mitigation actions will be carried forward into the decision.

IMPLEMENTING A COMPENSATORY MITIGATION PROGRAM

The BLM/Forest Service need to ensure that compensatory mitigation is strategically implemented to provide a net conservation gain to the species, as identified in the Regional Mitigation Strategy. In order to align with existing compensatory mitigation efforts, this compensatory mitigation program will be managed at a State-level (as opposed to a WAFWA Management Zone, a Field Office, or a Forest), in collaboration with our partners (e.g. Federal, Tribal, and State agencies).

To ensure transparent and effective management of the compensatory mitigation funds, the BLM/Forest Service will enter into a contract or agreement with a third-party to help manage the State-level compensatory mitigation funds, within one year of the issuance of the Record of Decision. The selection of the third-party compensatory mitigation administrator will conform to all relevant laws, regulations, and policies. The BLM/Forest Service will remain responsible for making decisions that affect Federal lands.

GLOSSARY TERMS

Additionality: The conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project. (adopted and modified from BLM Manual Section 1794).

Avoidance mitigation: Avoiding the impact altogether by not taking a certain action or parts of an action. (40 CFR 1508.20(a)) (e.g., may also include avoiding the impact by moving the proposed action to a different time or location.)

Compensatory mitigation: Compensating for the (residual) impact by replacing or providing substitute resources or environments. (40 CFR 1508.20)

Compensatory mitigation projects: The restoration, creation, enhancement, and/or preservation of impacted resources (adopted and modified from 33 CFR 332), such as on-the-ground actions to improve and/or protect habitats (e.g. chemical vegetation treatments, land acquisitions, conservation easements). (adopted and modified from BLM Manual Section 1794).

Compensatory mitigation sites: The durable areas where compensatory mitigation projects will occur. (adopted and modified from BLM Manual Section 1794).

Durability (protective and ecological): the maintenance of the effectiveness of a mitigation site and project for the duration of the associated impacts, which includes resource, administrative/legal, and financial considerations. (adopted and modified from BLM Manual Section 1794).

Minimization mitigation: Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (40 CFR 1508.20 (b)).

Residual impacts: Impacts that remain after applying avoidance and minimization mitigation; also referred to as unavoidable impacts.

Timeliness: The lack of a time lag between impacts and the achievement of compensatory mitigation goals and objectives. (BLM Manual Section 1794).

Appendix N

Fluid Mineral Stipulations, Waivers, Modifications, and Exceptions

APPENDIX N FLUID MINERAL STIPULATIONS, WAIVERS, MODIFICATIONS, AND EXCEPTIONS

This appendix lists by alternative surface use stipulations for new fluid mineral (oil and gas, and geothermal) leases referred to throughout this Proposed Land Use Plan Amendment (LUPA) and Final Environmental Impact Statement (FEIS). In addition to fluid mineral leases, these surface use stipulations would also apply, where appropriate and practical, to other surface-disturbing activities (and occupancy) associated with land use authorizations, permits, and leases issued on BLM-administered or National Forest System lands. Subject to valid existing rights and applicable law and policy, the stipulations would apply to uses and activities other than fluid mineral leasing. The intent is to manage other activities and uses in the same manner as fluid mineral leasing.

Surface-disturbing activities are those that normally result in more than negligible disturbance to public lands. These activities normally involve disturbance to soils and vegetation to the extent that reclamation is required. They include, but are not limited to, the use of mechanized earth-moving equipment; truck-mounted drilling equipment; certain geophysical exploration activities; off-road vehicle travel in areas designated as limited or closed to off-highway vehicle (OHV) use; placement of surface facilities such as utilities, pipelines, structures, and geothermal and oil and gas wells; new road construction; and use of pyrotechnics, explosives, and hazardous chemicals. Surface-disturbing activities would not include livestock grazing, cross-country hiking, driving on designated routes, and minimum-impact filming permits.

DESCRIPTION OF SURFACE STIPULATIONS

Table N.1 shows the stipulations for the Proposed Plan, including exceptions, modifications, and waivers. **Table N.2** shows the stipulations for Alternatives A and D from the Draft LUPA/EIS, including exceptions, modifications, and waivers. Three surface use stipulations could be applied to land use authorizations: (1) no surface occupancy (NSO), (2) timing limitations (TL), and

(3) controlled surface use (CSU). There are no stipulations included for Alternatives B, C, and F from the Draft LUPA/EIS because all habitat is closed to all fluid mineral activities. All stipulations for other resources, besides Greater Sage-Grouse (sage-grouse or GRSG), included in the existing land use plans would still be applicable.

Areas identified as NSO would not allow surface-disturbing activities.

Areas identified as CSU would require proposed actions to be authorized in accordance with the controls or constraints specified. The controls would be applicable to all surface-disturbing activities.

Areas identified as TL would not allow surface-disturbing activities during identified time frames. TL areas would remain open to operational and maintenance activities, including associated vehicle travel, during the restricted time period unless otherwise specified in the stipulation.

RELIEF FROM STIPULATIONS

With regards to fluid minerals, surface use stipulations could have exceptions, modifications, or waivers applied with approval by the authorized officer. **Tables N.1a**, **N.1b**, and **N.2** specify the types of habitat where these stipulations would/not apply:

Exception

An exception to this stipulation may be granted by the authorized officer, in consultation with the appropriate state agency (NDOW, SETT, CDFW), if the operator submits a plan that demonstrates that impacts from the proposed action meet the net conservation gain threshold, are minimal, or have no direct, indirect, or cumulative effects on GRSG habitat.

For those leases that occur on National Forest System lands, the Forest Service authorized officer would consult with the appropriate state agency to determine if the submitted plan demonstrates that impacts from the proposed action meet the net conservation gain threshold, are minimal, or have no direct, indirect, or cumulative effects on GRSG habitat. The Forest Service authorized officer would recommend to the BLM authorized officer to deny or accept the proposed exception.

Modification

The boundaries of the stipulated area may be modified if the authorized officer, in consultation with the appropriate state agency (NDOW, SETT, CDFW), determines that portions of the area can be occupied without adversely affecting GRSG population or habitat, or the area no longer contains GRSG use and habitat. The dates for timing limitations may be modified if new information indicates the dates are not valid for the leasehold.

For those leases that occur on National Forest System lands, the Forest Service authorized officer would consult with the appropriate state agency to determine if portions of the area can be occupied without adversely affecting GRSG population or habitat, or the area no longer contains GRSG use and habitat. The Forest Service authorized officer would recommend to the BLM authorized officer to deny or accept the proposed modification.

Waiver

The stipulation may be waived if the authorized officer, in consultation with the appropriate state agency (NDOW, SETT, CDFW), determines that the entire leasehold no longer contains suitable habitat nor is used by GRSG.

For those leases that occur on National Forest System lands, the Forest Service authorized officer would consult with the appropriate state agency to determine if determines that the entire leasehold no longer contains suitable habitat nor is used by GRSG. The Forest Service authorized officer would recommend to the BLM authorized officer to deny or accept the proposed waiver.

Inclusion in Environmental Analysis

The environmental analysis document prepared for site-specific proposals such as fluid minerals (oil and gas, and geothermal) development (i.e., operations plans for geothermal drilling permit or master development plans for applications for permit to drill or sundry notices) also would need to address proposals to exempt, modify, or waive a surface use stipulation.

On National Forest System lands, this process would follow regulatory requirements at 36 CFR 228.104. This process includes ensuring compliance with NEPA, and assessing if the action would be consistent with applicable federal laws, the current land and resource management plan, and meet management objectives.

On BLM-administered lands, to exempt, modify, or waive a stipulation, the environmental analysis document would have to show that (I) the circumstances or relative resource values in the area had changed following issuance of the lease, (2) less restrictive requirements could be developed to protect the resource of concern, and (3) operations could be conducted without causing unacceptable impacts.

With respect to granting relief from stipulations on other types of authorizations, such as solid mineral leases and land use authorizations, any changes to the contractual nature of these instruments would require environmental review and coordination with the Lessee, permittee, or authorization holder when specific surface-disturbing activities are proposed via an operation plan, permitting action, or similar instrument.

STANDARD TERMS AND CONDITIONS

All surface-disturbing activities are subject to standard terms and conditions. These include the stipulations that are required for proposed actions in order to comply with the Endangered Species Act. Standard terms and conditions for fluid mineral leasing provide for relocation of proposed operations up to 200 meters and for prohibiting surface-disturbing operations for a period not to exceed 60 days. The stipulations addressed in **Tables N.I** and **N.2** that are within the parameters of 200 meters and 60 days are considered open to fluid mineral leasing, subject to standard terms and conditions.

Table N.Ia
Proposed Plan -Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

Language from Land	Stipulation SG-01-NSO: Sagebrush Focal Areas – Managed as No Surface
Use Plan	Occupancy (NSO), without waiver, exception, or modification, for fluid
Amendment	mineral leasing (oil, gas, and geothermal).
Objective	To protect Greater Sage-Grouse habitat within the Sagebrush Focal Areas
	(SFAs).
Stipulation Type	Major Constraint
Stipulation	No Surface Occupancy
Exception	None
Modification	None
Waiver	None
Language from Land	Stipulation SG-02-NV-OG-NSO: Priority Habitat Management Areas
Use Plan	(PHMA) outside of Sagebrush Focal Areas—Manage oil and gas resources in
Amendment	Nevada as No Surface Occupancy (NSO), with two exceptions.
Objective	To protect Greater Sage-Grouse habitat in Priority Habitat Management
	Areas (PHMA)
Stipulation Type	Major Constraint
Stipulation	No Surface Occupancy
Exception	The Authorized Officer may grant an exception to an oil and gas lease no-
	surface-occupancy stipulation only where the proposed action:
	(i) Would not have direct, indirect, or cumulative effects on GRSG or its habitat; or,
	(ii) Is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and would provide a clear net conservation gain to GRSG and its habitat.
	Exceptions based on conservation gain (ii) may only be considered in (a) PHMAs of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal oil and gas lease existing as of the date of this RMP amendment. Exceptions based on conservation gain must also include measures, such as enforceable institutional controls and buffers, sufficient to allow the BLM to conclude that such benefits will endure for the duration of the proposed action's impacts.

Table N.Ia
Proposed Plan –Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

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	Any exceptions to this lease stipulation may be approved by the Authorized Officer only with the concurrence of the State Director. The Authorized Officer may not grant an exception unless the applicable state wildlife agency, the USFWS, and the BLM unanimously find that the proposed action satisfies (i) or (ii). Such finding shall initially be made by a team of one field biologist or other GRSG expert from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the appropriate BLM State Director, USFWS State Ecological Services Director, and state wildlife agency head for final resolution. In the event their finding is not unanimous, the exception will not be granted. Approved exceptions will be made publicly available at least quarterly.
Modification	None
Waiver	None
Language from Land Use Plan Amendment	Stipulation SG-02-CA-NSO: Priority Habitat Management Areas (PHMA) outside of Sagebrush Focal Areas— Manage fluid mineral resources (oil, gas, and geothermal) in California as No Surface Occupancy (NSO), with two exceptions.
Objective	To protect Greater Sage-Grouse habitat in Priority Habitat Management Areas (PHMA)
Stipulation Type	Major Constraint
Stipulation	No Surface Occupancy
Exception	The Authorized Officer may grant an exception to an oil and gas lease no- surface-occupancy stipulation only where the proposed action:
	(i) Would not have direct, indirect, or cumulative effects on GRSG or its habitat; or,
	(ii) Is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and would provide a clear net conservation gain to GRSG and its habitat.
	Exceptions based on conservation gain (ii) may only be considered in (a) PHMAs of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal oil and gas lease existing as of the date of this RMP amendment. Exceptions based on conservation gain must also include measures, such as enforceable institutional controls and buffers, sufficient to allow the BLM to conclude that such benefits will endure for the duration of the proposed action's impacts.
	Any exceptions to this lease stipulation may be approved by the Authorized Officer only with the concurrence of the State Director. The Authorized Officer may not grant an exception unless the applicable state wildlife agency, the USFWS, and the BLM unanimously find that the proposed action satisfies (i) or (ii). Such finding shall initially be made by a team of one field biologist or other GRSG expert from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the appropriate BLM

Table N. Ia
Proposed Plan –Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

	State Director, USFWS State Ecological Services Director, and state wildlife agency head for final resolution. In the event their finding is not unanimous, the exception will not be granted. Approved exceptions will be made publicly available at least quarterly.
Modification	None
Waiver	None
Language from Land	Stipulation SG-02-NV-GEOT-NSO: Priority Habitat Management Areas
Use Plan	(PHMA) outside of Sagebrush Focal Areas— Manage Nevada geothermal
Amendment	resources as No Surface Occupancy (NSO), with one exception.
Objective	To protect Greater Sage-Grouse habitat in Priority Habitat Management
•	Areas
Stipulation Type	Major Constraint
Stipulation	No Surface Occupancy
Exception	Geothermal projects within portions of the Nevada PHMAs outside of SFAs
	may be considered for authorization, if all of the following conditions are met:
	 A team comprised of BLM, FWS, and NDOW specialists advises the BLM State Director on appropriate mitigation measures for the project and its ancillary facilities, including lek buffer distances using the best available science;
	 Mitigation actions are consistent with this Plan's mitigation strategy such as the Nevada Conservation Credit System, and;
	 The footprint of the project is consistent with the Disturbance Management Protocols identified in this Plan (see Action SSS 2 and Appendix I).
Modification	None
Waiver	None
Language from Land	In PHMA in California only, limit the density of energy and mining facilities
Use Plan	during project authorization to an average of one energy/mineral facility per
Amendment	640 acres.
Objective	To protect PHMAs and the life-history needs of GRSG from habitat loss and GRSG populations from disturbance and limit fragmentation in PHMAs. This would be implemented as a lease notice associated with new leases, in addition to the No Surface Occupancy stipulations. This would only be applicable to new oil and gas leases if the exception criteria identified for the NSO stipulation above were granted.
Stipulation Type	Lease Notice
Stipulation	Lease Notice
Exception	None
Modification	None
Waiver	None

Table N.Ia
Proposed Plan –Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

Language from Land	Stimulation SC 02 TL. Second Dueto stien within 40 miles of cating and
Language from Land	Stipulation SG-03-TL: Seasonal Protection within 4.0 miles of active or
Use Plan	pending Greater Sage-Grouse leks in General Management Habitat Areas
Amendment	(GHMA)- Manage fluid mineral resources with timing limitations.
Objective	To protect Greater Sage-Grouse lekking habitat.
Stipulation Type	Timing Limitation.
Stipulation	No surface occupancy would be allowed within 4.0 miles of active or pending
	Greater Sage-Grouse leks from March 1 through May 15.
Exception	The Authorized Officer may grant an exception where an environmental
	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the action, as proposed or
	otherwise restricted, does not adversely affect Greater Sage-Grouse or its
	habitat. An exception may also be granted if the proponent, BLM, and
	appropriate state agency negotiate mitigation that would provide a clear net
	conservation gain to GRSG and its habitat.
Modification	The Authorized Officer may modify the size and shape of the restricted area,
	or the period of limitation, where an environmental review and consultation
	with the appropriate state agency (Nevada Department of Wildlife, Sagebrush
	Ecosystem Technical Team, California Department of Fish and Wildlife)
	determines that the action, as proposed or otherwise restricted, does not
	adversely affect Greater Sage-Grouse or its habitat.
Waiver	The Authorized Officer may wave the stipulation where an environmental
	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the described lands do not
	contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of
	serving the requirements of Greater Sage-Grouse and therefore no longer
	warrant consideration as a component necessary for their protection.
	warrante construct as a component necessary for their procession.
Language from Land	Stipulation SG-04-TL: Seasonal Protection of Greater Sage-Grouse winter
Use Plan	habitat from November 1 through February 28 in General Habitat
Amendment	Management Areas (GHMAs).
Objective	To protect Greater Sage-Grouse winter habitat.
Stipulation Type	Timing Limitation.
Stipulation	No surface occupancy would be allowed in Greater Sage-Grouse winter
Evention	habitat from November 1 through February 28.
Exception	The Authorized Officer may grant an exception where an environmental
	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the action, as proposed or
	otherwise restricted, does not adversely affect Greater Sage-Grouse or its
	habitat. An exception may also be granted if the proponent, BLM, and
	appropriate state agency negotiate mitigation that would provide a clear net
	conservation gain to GRSG and its habitat.
Modification	The Authorized Officer may modify the size and shape of the restricted area,
	or the period of limitation, where an environmental review and consultation
	with the appropriate state agency (Nevada Department of Wildlife, Sagebrush
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Table N. Ia
Proposed Plan –Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

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	Ecosystem Technical Team, California Department of Fish and Wildlife)
	determines that the action, as proposed or otherwise restricted, does not
	adversely affect Greater Sage-Grouse or its habitat.
Waiver	The Authorized Officer may wave the stipulation where an environmental
	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	· ·
	Department of Fish and Wildlife) determines that the described lands do not
	contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of
	serving the requirements of Greater Sage-Grouse and therefore no longer
	warrant consideration as a component necessary for their protection.
Language from Land	Stipulation SG-05-TL: Seasonal protection of Greater Sage-Grouse early
Use Plan	brood-rearing habitat from May 15 through June 15 in General Habitat
Amendment	Management Areas (GHMAs).
Objective	To protect Greater Sage-Grouse early brood rearing habitat.
Stipulation Type	Timing Limitation.
Stipulation	No surface occupancy would be allowed in GRSG early brood-rearing habitat
	from May 15 through June 15.
Exception	The Authorized Officer may grant an exception where an environmental
Exception	review and consultation with the appropriate state agency (Nevada
	1, 1
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the action, as proposed or
	otherwise restricted, does not adversely affect Greater Sage-Grouse or its
	habitat. An exception may also be granted if the proponent, BLM, and
	appropriate state agency negotiate mitigation that would provide a clear net
	conservation gain to GRSG and its habitat.
Modification	The Authorized Officer may modify the size and shape of the restricted area,
	or the period of limitation, where an environmental review and consultation
	with the appropriate state agency (Nevada Department of Wildlife, Sagebrush
	Ecosystem Technical Team, California Department of Fish and Wildlife)
	determines that the action, as proposed or otherwise restricted, does not
	adversely affect Greater Sage-Grouse or its habitat.
Waiver	The Authorized Officer may wave the stipulation where an environmental
V V 41.1 C.	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the described lands do not
	,
	contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of
	serving the requirements of Greater Sage-Grouse and therefore no longer
	warrant consideration as a component necessary for their protection.
Language from Land	Stipulation SG-06-TL: Seasonal protection of Greater Sage-Grouse late
Use Plan	brood-rearing habitat from June 15 through September 15 in General Habitat
Amendment	Management Areas (GHMAs).
Objective	To protect Greater Sage-Grouse late brood-rearing habitat.
Stipulation Type	Timing Limitation.
Stipulation	No surface occupancy would be allowed in Greater Sage-Grouse late brood
•	rearing habitat from June 15 through September 15.
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Table N.Ia
Proposed Plan –Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

	1 - I fully Printer at Scipulations for Greater Sage-Grouse Plabitat
Exception	The Authorized Officer may grant an exception where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the action, as proposed or otherwise restricted, does not adversely affect Greater Sage-Grouse or its habitat. An exception may also be granted if the proponent, BLM, and appropriate state agency negotiate mitigation that would provide a clear net conservation gain to GRSG and its habitat.
Modification	The Authorized Officer may modify the size and shape of the restricted area, or the period of limitation, where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the action, as proposed or otherwise restricted, does not adversely affect Greater Sage-Grouse or its habitat.
Waiver	The Authorized Officer may wave the stipulation where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the described lands do not contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of serving the requirements of GRSG and therefore no longer warrant consideration as a component necessary for their protection.
Language from Land Use Plan	Stipulation SG-07-TL: Seasonal protection of Greater Sage-Grouse fall habitat from September 1 through October 31 in General Habitat
Amendment	Management Areas (GHMAs).
Objective	To protect Greater Sage-Grouse fall habitat.
Stipulation Type	Timing Limitation.
Stipulation	No surface occupancy would be allowed in Greater Sage-Grouse fall habitat from September 1 through October 31.
Exception	The Authorized Officer may grant an exception where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the action, as proposed or otherwise restricted, does not adversely affect Greater Sage-Grouse or its habitat. An exception may also be granted if the proponent, BLM, and appropriate state agency negotiate mitigation that would provide a clear net conservation gain to GRSG and its habitat.
Modification	The Authorized Officer may modify the size and shape of the restricted area, or the period of limitation, where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the action, as proposed or otherwise restricted, does not adversely affect Greater Sage-Grouse or its habitat.
Waiver	The Authorized Officer may wave the stipulation where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the described lands do not

Table N. Ia Proposed Plan –Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

	contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of
	serving the requirements of GRSG and therefore no longer warrant
	consideration as a component necessary for their protection.
Language from Land	Stipulation SG-08-CSU: Authorizations/permits would limit noise from
Use Plan	discretionary activities (during construction, operation, or maintenance) to
Amendment	not exceed 10 decibels above ambient sound levels at least 0.25 miles from
	active and pending leks from 2 hours before to 2 hours after sunrise and
	sunset during the breeding season from March 1 through May 15.
Objective	To protect Greater Sage-Grouse lek sites
Stipulation Type	Controlled Surface Use
Stipulation	Authorizations/permits would limit noise from discretionary activities (during
o.pa.ac.o	construction, operation, or maintenance) to not exceed 10 decibels above
	ambient sound levels at least 0.25 miles from active and pending leks from 2
	hours before to 2 hours after sunrise and sunset during the breeding season
	from March 1 through May 15.
Exception	None
Modification	None
Waiver	None
vvaivei	None
Language francisco	Stipulation SG-9-CSU: BLM will apply lek buffer-distances as
Language from Land Use Plan	11 /
	recommended in the United States Geological Service Report Conservation
Amendment	Buffer Distance estimates for Greater Sage Grouse- A Review Open File-
	Report 2014-1239 (Manier et al. 2014). (See Appendix B)
Objective	To protect Greater Sage-Grouse leks
Stipulation Type	Controlled Surface Use
Stipulation	The BLM will apply lek buffer-distances specified as the lower end of the
	interpreted range in the report unless justifiable departures are determined to
	be appropriate (see below). The lower end of the interpreted range of the
	lek buffer-distances is as follows:
	Innear features (roads) within 3.1 miles of leks
	 infrastructure related to energy development within 3.1 miles of leks.
	• tall structures (e.g., communication or transmission towers, transmission
	lines) within 2 miles of leks.
	• low structures (e.g., fences, rangeland structures) within 1.2 miles of leks.
	• surface disturbance (continuing human activities that alter or remove the
	natural vegetation) within 3.1 miles of leks.
	noise and related disruptive activities including those that do not result in
	habitat loss (e.g., motorized recreational events) at least 0.25 miles from
	leks.
Exception	Justifiable departures to decrease or increase from these distances, based on
	local data, best available science, landscape features, and other existing
	protections (e.g., land use allocations, state regulations) may be appropriate
	for determining activity impacts. The United States Geological Service (USGS)
	report recognized "that because of variation in populations, habitats,
	development patterns, social context, and other factors, for a particular
	disturbance type, there is no single distance that is an appropriate buffer for
	•

Table N.Ia
Proposed Plan –Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

MadiCastian	all populations and habitats across the sage-grouse range". The USGS report also states that "various protection measures have been developed and implemented [which have] the ability (alone or in concert with others) to protect important habitats, sustain populations, and support multiple-use demands for public lands". All variations in lek buffer-distances will require appropriate analysis and disclosure as part of activity authorization.
Modification	None
Waiver	None
Language from Land	Stipulation SG-NV-10-CSU: Nevada 3% Disturbance Cap- New
Use Plan	development/activity would not exceed the 3% disturbance cap protocol at
Amendment	either the Biological Significant Unit (BSU) or project scale, unless a technical
	team (described under the exception) determines that new or site-specific information indicates the project could be modified to result in a net conservation gain at the BSU level.
Objective	To create a net conservation gain at the project and BSU level.
Stipulation Type	Controlled Surface Use
Stipulation	New development/activity would not exceed the 3% disturbance cap protocol at either the Biological Significant Unit (BSU) or project scale, unless a technical team (described under the exception) determines that new or site-specific information indicates the project could be modified to result in a net conservation gain at the BSU level.
Exception	Nevada Lands Only- Any exceptions to the disturbance cap may be approved by the Authorized Officer only with the concurrence of the State Director. The Authorized Officer may not grant an exception unless the Nevada Department of Wildlife (NDOW), the United States Fish and Wildlife Service (USFWS), and the BLM unanimously find that the proposed action satisfies the conditions stated in the stipulation. Such finding shall initially be made by the technical team, which consists of a field biologist or other Greater Sage-Grouse expert from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the BLM State Director, USFWS State Ecological Services Director and NDOW Director for final resolution. In the event their recommendation is not unanimous to grant the exception, the exception will not be granted.
Modification	None
Waiver	None
Language from Land	Stipulation SG-CA-II-CSU: California 3% Disturbance Cap- New
Use Plan	development/activity would not exceed the 3% disturbance cap at either the
Amendment	Biological Significant Unit (BSU) or project scale.
Objective	To create a net conservation gain at the project and BSU level.
Stipulation Type	Controlled Surface Use
Stipulation	New development/activity would not exceed the 3% disturbance cap at either
-	the Biological Significant Unit (BSU) or project scale.
Exception	None
Modification	None
Waiver	None
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Table N.1b

Alternatives B-F -Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

Language from Land	Stipulation 1: Priority Habitat Management Areas (PHMAs): Manage Fluid
Use Plan	
Amendment	Minerals under a No Surface Occupancy (NSO).
	To a make at Constant Constant Constant behive in Deliveries Helicate Management
Objective	To protect Greater Sage-Grouse habitat in Priority Habitat Management
	Areas (PHMA)
Stipulation Type	Major Constraint
Stipulation	No Surface Occupancy
Exception	None
Modification	None
Waiver	None
Language from Land	Stipulation 2: General Habitat Management Areas (PHMAs): Manage Fluid
Use Plan	Minerals under a No Surface Occupancy (NSO).
Amendment	, , , ,
Objective	To protect Greater Sage-Grouse habitat in General Habitat Management
·	Areas (PHMA)
Stipulation Type	Major Constraint
Stipulation	No Surface Occupancy
Exception	The Authorized Officer may grant an exception where an environmental
•	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the action, as proposed or
	otherwise restricted, does not adversely affect Greater Sage-Grouse or its
	habitat. An exception may also be granted if the proponent, BLM, and
	appropriate state agency negotiate mitigation that would provide a clear net
	conservation gain to GRSG and its habitat.
Modification	The Authorized Officer may modify the size and shape of the restricted area,
- 10 4111 64410 11	or the period of limitation, where an environmental review and consultation
	with the appropriate state agency (Nevada Department of Wildlife, Sagebrush
	Ecosystem Technical Team, California Department of Fish and Wildlife)
	determines that the action, as proposed or otherwise restricted, does not
	adversely affect Greater Sage-Grouse or its habitat.
Waiver	The Authorized Officer may wave the stipulation where an environmental
	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the described lands do not
	contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of
	serving the requirements of Greater Sage-Grouse and therefore no longer
	warrant consideration as a component necessary for their protection.
	The state of the s
Language from Land	Stipulation 3: Seasonal Protection within 4.0 miles of active or pending
Use Plan	Greater Sage-Grouse leks in General Management Habitat Areas (GHMA)-
Amendment	Manage fluid mineral resources with timing limitations.
Objective	To protect Greater Sage-Grouse lekking habitat.
Stipulation Type	Timing Limitation.
Supulation Type	Timing Limitation.

Table N. I b

Alternatives B-F -Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

No surface occupancy would be allowed within 4.0 miles of active or pending Greater Sage-Grouse leks from March I through May 15.		
The Authorized Officer may grant an exception where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the action, as proposed or otherwise restricted, does not adversely affect Greater Sage-Grouse or its habitat. An exception may also be granted if the proponent, BLM, and appropriate state agency negotiate mitigation that would provide a clear net conservation gain to GRSG and its habitat. Modification Modification The Authorized Officer may modify the size and shape of the restricted area, or the period of limitation, where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the action, as proposed or otherwise restricted, does not adversely affect Greater Sage-Grouse or its habitat. The Authorized Officer may wave the stipulation where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the described lands do not contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of serving the requirements of Greater Sage-Grouse and therefore no longer warrant consideration as a component necessary for their protection. Language from Land Use Plan Amendment Objective To protect Greater Sage-Grouse winter habitat from November I through February 28 in General Habitat Management Areas (GHMAs). The Authorized Officer may grant an exception where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife) determines that the action, as proposed or otherwise restricted, does not adversely affect Greater Sage-Grouse or its habitat. An exception may also be granted if the proponent, BLM, and appropriate s	Stipulation	· · ·
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		auversely affect Greater Sage-Grouse of its habitat.

Table N. I b

Alternatives B-F -Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

Waiver	The Authorized Officer may wave the stipulation where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the described lands do not contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of serving the requirements of Greater Sage-Grouse and therefore no longer warrant consideration as a component necessary for their protection.
Language from Land	Stipulation 5: Seasonal protection of Greater Sage-Grouse early brood-
Use Plan	rearing habitat from May 15 through June 15 in General Habitat Management
Amendment	Areas (GHMAs).
Objective	To protect Greater Sage-Grouse early brood rearing habitat.
Stipulation Type	Timing Limitation.
Stipulation	No surface occupancy would be allowed in GRSG early brood-rearing habitat from May 15 through June 15.
Exception	The Authorized Officer may grant an exception where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the action, as proposed or otherwise restricted, does not adversely affect Greater Sage-Grouse or its habitat. An exception may also be granted if the proponent, BLM, and appropriate state agency negotiate mitigation that would provide a clear net conservation gain to GRSG and its habitat.
Modification	The Authorized Officer may modify the size and shape of the restricted area, or the period of limitation, where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the action, as proposed or otherwise restricted, does not adversely affect Greater Sage-Grouse or its habitat.
Waiver	The Authorized Officer may wave the stipulation where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California Department of Fish and Wildlife) determines that the described lands do not contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of serving the requirements of Greater Sage-Grouse and therefore no longer warrant consideration as a component necessary for their protection.
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Language from Land Use Plan	Stipulation 6: Seasonal protection of Greater Sage-Grouse late brood-
Amendment	rearing habitat from June 15 through September 15 in General Habitat Management Areas (GHMAs).
Objective	To protect Greater Sage-Grouse late brood-rearing habitat.
Stipulation Type	Timing Limitation.
Stipulation	No surface occupancy would be allowed in Greater Sage-Grouse late brood
	rearing habitat from June 15 through September 15.
Exception	The Authorized Officer may grant an exception where an environmental review and consultation with the appropriate state agency (Nevada Department of Wildlife, Sagebrush Ecosystem Technical Team, California

Table N. I b
Alternatives B-F -Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

	-F -Fluid Milleral Scipulations for Greater Sage-Grouse Habitat
	Department of Fish and Wildlife) determines that the action, as proposed or
	otherwise restricted, does not adversely affect Greater Sage-Grouse or its
	habitat. An exception may also be granted if the proponent, BLM, and
	appropriate state agency negotiate mitigation that would provide a clear net
	conservation gain to GRSG and its habitat.
Modification	The Authorized Officer may modify the size and shape of the restricted area,
	or the period of limitation, where an environmental review and consultation
	with the appropriate state agency (Nevada Department of Wildlife, Sagebrush
	Ecosystem Technical Team, California Department of Fish and Wildlife)
	determines that the action, as proposed or otherwise restricted, does not
	adversely affect Greater Sage-Grouse or its habitat.
Waiver	The Authorized Officer may wave the stipulation where an environmental
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	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the described lands do not
	contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of
	serving the requirements of GRSG and therefore no longer warrant
	consideration as a component necessary for their protection.
Language from Land	Stipulation 7: Seasonal protection of Greater Sage-Grouse fall habitat from
Use Plan	September I through October 31 in General Habitat Management Areas
Amendment	(GHMAs).
Objective	To protect Greater Sage-Grouse fall habitat.
Stipulation Type	Timing Limitation.
Stipulation	No surface occupancy would be allowed in Greater Sage-Grouse fall habitat
•	from September 1 through October 31.
Exception	The Authorized Officer may grant an exception where an environmental
-	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the action, as proposed or
	otherwise restricted, does not adversely affect Greater Sage-Grouse or its
	habitat. An exception may also be granted if the proponent, BLM, and
	appropriate state agency negotiate mitigation that would provide a clear net
	conservation gain to GRSG and its habitat.
Modification	The Authorized Officer may modify the size and shape of the restricted area,
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	with the appropriate state agency (Nevada Department of Wildlife, Sagebrush
	Ecosystem Technical Team, California Department of Fish and Wildlife)
	determines that the action, as proposed or otherwise restricted, does not
	adversely affect Greater Sage-Grouse or its habitat.
Waiver	The Authorized Officer may wave the stipulation where an environmental
	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the described lands do not
	contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of
	serving the requirements of GRSG and therefore no longer warrant
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	Consideration as a component necessary for their protection.

Table N. I b

Alternatives B-F -Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

Language from Land	Stipulation 8: Authorizations/permits would limit noise from discretionary
Use Plan	activities (during construction, operation, or maintenance) to not exceed 10
Amendment	decibels above ambient sound levels at least 0.25 miles from active and
, menament	pending leks from 2 hours before to 2 hours after sunrise and sunset during
	the breeding season from March 1 through May 15.
Objective	To protect Greater Sage-Grouse lek sites
Stipulation Type	Controlled Surface Use
Stipulation	Authorizations/permits would limit noise from discretionary activities (during
Scipulación	construction, operation, or maintenance) to not exceed 10 decibels above ambient sound levels at least 0.25 miles from active and pending leks from 2
	hours before to 2 hours after sunrise and sunset during the breeding season
	from March 1 through May 15.
Exception	None
Modification	None
Waiver	None
7741761	THORE
Language from Land	Stipulation 9: Proximity of Tall Structures from Leks and Nesting Habitat: 3
Use Plan	miles (5 kilometers).
Amendment	,
Objective	To protect Greater Sage-Grouse lek sites and nesting habitat
Stipulation Type	Controlled Surface Use
Stipulation	Due not place tall structures within 3 miles of Leks and Nesting Habitat.
Exception	The Authorized Officer may grant an exception where an environmental
•	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the action, as proposed or
	otherwise restricted, does not adversely affect Greater Sage-Grouse or its
	habitat. An exception may also be granted if the proponent, BLM, and
	appropriate state agency negotiate mitigation that would provide a clear net
	conservation gain to GRSG and its habitat.
Modification	The Authorized Officer may modify the size and shape of the restricted area,
	or the period of limitation, where an environmental review and consultation
	with the appropriate state agency (Nevada Department of Wildlife, Sagebrush
	Ecosystem Technical Team, California Department of Fish and Wildlife)
	determines that the action, as proposed or otherwise restricted, does not
	adversely affect Greater Sage-Grouse or its habitat.
Waiver	The Authorized Officer may wave the stipulation where an environmental
	review and consultation with the appropriate state agency (Nevada
	Department of Wildlife, Sagebrush Ecosystem Technical Team, California
	Department of Fish and Wildlife) determines that the described lands do not
	contain Greater Sage-Grouse or suitable habitat or are otherwise incapable of
	serving the requirements of GRSG and therefore no longer warrant
	consideration as a component necessary for their protection.

Table N. I b

Alternatives B-F -Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

Language from Land	Stipulation 10: California 3% Disturbance Cap- New development/activity								
Use Plan	would not exceed the 3% disturbance cap.								
Amendment									
Objective	To create a net conservation gain at the project and BSU level.								
Stipulation Type	Controlled Surface Use								
Stipulation	New development/activity would not exceed the 3% disturbance cap.								
Exception	None								
Modification	None								
Waiver	None								
Language from Land	Stipulation SG-NV-11-CSU: Nevada 3% Disturbance Cap- New								
Use Plan	development/activity would not exceed the 3% disturbance cap protocol at								
Amendment	either the Biological Significant Unit (BSU) or project scale, unless a technical								
	team (described under the exception) determines that new or site-specific								
	information indicates the project could be modified to result in a net								
	conservation gain at the BSU level.								
Objective	To create a net conservation gain at the project and BSU level.								
Stipulation Type	Controlled Surface Use								
Stipulation	New development/activity would not exceed the 3% disturbance cap protocol at either the Biological Significant Unit (BSU) or project scale, unless a technical team (described under the exception) determines that new or site-specific information indicates the project could be modified to result in a net conservation gain at the BSU level.								
Exception	Nevada Lands Only- Any exceptions to the disturbance cap may be approved by the Authorized Officer only with the concurrence of the State Director. The Authorized Officer may not grant an exception unless the Nevada Department of Wildlife (NDOW), the United States Fish and Wildlife Service (USFWS), and the BLM unanimously find that the proposed action satisfies the conditions stated in the stipulation. Such finding shall initially be made by the technical team, which consists of a field biologist or other Greater Sage-Grouse expert from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the BLM State Director, USFWS State Ecological Services Director and NDOW Director for final resolution. In the event their recommendation is not unanimous to grant the exception, the exception will not be granted.								
Modification	None								
Waiver	None								

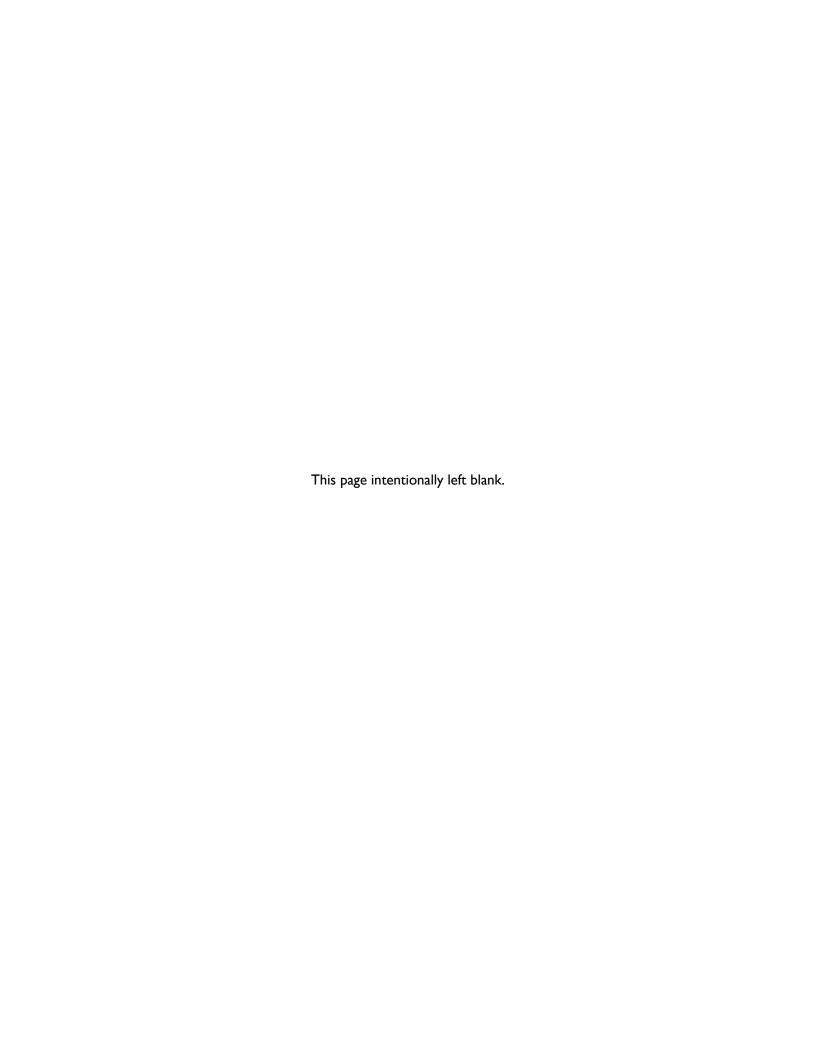


Table N-2
Draft LUPA/ EIS Alternative A Fluid Mineral Stipulations

District:	Tonopah	Battle Mountain	Mount Lewis	Carson City	Elko	Ely	Las Vegas	Tonopah	Winnemucca
	N. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.				ons for Greater Sage-G				
Stipulation:		Timing Limitation	Greater Sage Grouse	No Stipulation	This lease contains	Stipulation: No surface	No Stipulation	No Stipulation	No surface occupancy
	surface use is allowed	Stipulation NSO-065-	March 1st-May 15 th :		lands which have been	occupancy. No surface			within 3.3 km (2 miles)
	within 0.25 mile radius		Avoid mineral or		identified as GRSG	use would be allowed			of known leks at all
	of a GRSG lek(s). All	No surface use is	energy related facilities		strutting grounds	within 0.25 mile of a			times.
	valleys throughout the	allowed during the	within 2 miles of active		(leks) that are subject	GRSG lek.			
	BLM Battle Mountain	following time	leks (strutting		to seasonal protection				
	Resource Area. This	period(s). This	grounds). Minimize		from disturbance. No	Objective: To protect			
	stipulation does not	stipulation does not	human activity within		Surface Occupancy is	GRSG breeding			
	apply to operations	apply to operations	view (or by at least 0.6		permitted within 0 .5	activities and the			
	and maintenance of	and maintenance of	mile) of leks especially		miles, or other, lesser,	integrity of the habitat			
	production facilities.	production facilities.	between midnight and		appropriate distance	associated with GRSG			
		On the land described	10:00AM.		based on site-specific	leks to maintain GRSG			
	Sage-Grouse Lek(s):	below:	A		conditions, of GRSG	populations.			
	For the purpose of:		April 15th-July 30 th :		leks.				
	a. Protection of	Sage Grouse Lek(s): A	Avoid nesting areas,			Exception: An			
	GRSG breeding	2 mile radius around a	the majority of which			exception to this			
	activities and the	GRSG lek(s) from	are within a two mile			stipulation may be			
	integrity of the habitat	March 15 to May 1.	radius of lek sites in			granted by the			
	associated with GRSG	, ,	big sage.			authorized officer, in			
	leks to maintain GRSG	the BLM Battle				consultation with			
	population, Tonopah	Mountain Resource	June 1st- November			Nevada Department			
	RMP, p. 8 and Plan	Area.	Ist: Avoid brood			of Wildlife, if the			
	Maintenance Sheet 3.		rearing areas			operator submits a			
			(especially riparian			plan that			
	Any changes to this		areas where broods			demonstrates that			
	stipulation will be		concentrate beginning			impacts from the			
	made in accordance		usually in June) by 0.6			proposed action			
	with the land use plan		mile.			would not affect			
	and/or the regulatory		,			breeding activity nor			
	provisions for such		Dates will vary:			degrade the integrity			
	changes. For guidance		A CDCC			of the habitat			
	on the use of the		Avoid GRSG wintering			associated with the			
	stipulation, see BLM		areas by 0.6 mile while			GRSG lek.			
	Manual 1624 and		occupied.			M I'C .: TI			
	3103.		NAC TO THE RESIDENCE OF THE PARTY OF THE PAR			Modification: The			
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		Minimize disturbance			boundaries of the			
	NV-065-23: No		of vegetation in all			stipulated area may be			
	surface activity is		known GRSG habitats.			modified if the			
	allowed within two					authorized officer, in			
	miles of a GRSG lek		Do not allow dogs to			consultation with			
	from March I through		run loose on project			Nevada Department			
	May 15. This		sites. Disturbance of			of Wildlife, determines			
	stipulation does not		nesting or brood			that portions of the			
	apply to operations		rearing GRSG by dogs			area can be occupied			
	and maintenance of		may cause the GRSG			without adversely			

Table N-2
Draft LUPA/ EIS Alternative A Fluid Mineral Stipulations

District:	Tonopah	Battle Mountain Mount Lewis	Carson City	Elko	Ely	Las Vegas	Tonopah	Winnemucca
	production facilities.	to abandon nest or	,		affecting the GRSG		•	
		young.			lek.			
	Sage Grouse Nesting							
	Habitat Associated				Waiver: The			
	with Leks for the				stipulation may be			
	purpose of:				waived if the			
	a. Protection of GRSG				authorized officer, in			
	nesting activities associated with leks to				consultation with Nevada Department			
	maintain GRSG				of Wildlife, determines			
	populations, Tonopah				that the lek has been			
	RMP, p. 8 and Plan				inactive for at least			
	Maintenance Sheet 3.				five consecutive years			
	Any changes to this				or the habitat has			
	stipulation will be				changed such that			
	made in accordance				there is no likelihood			
	with the land use plan				the lek would become			
	and/or the regulatory				active.			
	provisions for such							
	changes. For guidance							
	on the use of the stipulation, see BLM							
	Manual 1624 and							
	3103.							
	1 5105.		Stipulations for Great	er Sage-Grouse Bro	ood Rearing			
Stipulation:	No Stipulation	Greater Sage Grouse No Stipulation	This lease contains	No Stipulation	No Stipulation	No Stipulation	NV-WDO-WILD-02,	No Stipulation
		March 1st-May 15th	lands which have been				TL (2002/2008)	
		Avoid mineral or	identified as GRSG				Timing limitations on	
		energy related facilities	brood rearing areas				known or potential	
		within 2 miles of active	that are subject to				GRSG habitat. Prior	
		leks (strutting	seasonal protection from disturbance.				to entry on any lease areas which include	
		grounds). Minimize human activity within	Seasonal restrictions				known or potential	
		view (or by at least 0.6	from disturbance in				habitat, the lessee	
		mile) of leks especially	GRSG brood rearing				(operator) shall	
		between midnight and	areas apply within 0.5				contact the	
		10:00AM.	miles or other				appropriate BLM Field	
			appropriate distance				Office to discuss any	
		April 15th-July 30th	based on site-specific				proposed activities.	
		Avoid nesting areas,	conditions from 5/15				During the times	
		the majority of which	to 8/15, inclusive. This				specified below, avoid	
		are within a two mile	restriction does not				all development or	
		radius of lek sites in	apply to operating				exploration activities	
		big sage.	facilities.				within known or	
		June 1st- November					potential nesting, brood-rearing and	
	l .	June 1st- Movember		<u> </u>			brood-rearing and	

Table N-2
Draft LUPA/ EIS Alternative A Fluid Mineral Stipulations

District:	Tonopah	Battle Mountain	Mount Lewis	Carson City	Elko	Ely	Las Vegas	Tonopah	Winnemucca
		Ist Avoid brood rearing						winter habitat, and within 1 km (0.6 mile)	
		areas (especially						of known or potential	
		riparian areas where						habitat (PMUs). The	
		broods concentrate						times specified are per	
		beginning usually in						interim NV Guidelines	
		June) by 0.6 mile.						or as determined by Field Office and	
		Dates will vary:						Wildlife personnel.	
		Avoid GRSG wintering							
		areas by 0.6 mile while						Nesting habitat and	
		occupied. Minimize disturbance						brood-rearing habitats: April through August	
		of vegetation in all						Winter habitats:	
		known GRSG habitats.						October through	
		Do not allow dogs to						March	
		run loose on project sites. Disturbance of							
		nesting or brood							
		rearing GRSG by dogs							
		may cause the GRSG to abandon nest or							
		young.							
		1 / 8.	Stip	ulations for Greater	Sage-Grouse Crucial W	/inter Range			
Stipulation:			Greater Sage Grouse	No Stipulation	This lease contains	Stipulation: Timing	No Stipulation	No Stipulation	NV-WDO-WILD-02,
	Stipulation NSO-065- 06		March 1st-May 15th Avoid mineral or		lands which have been identified as GRSG	Limitation. No surface activity would be			TL (2002/2008) Timing limitations on
	No surface use is		energy related facilities		crucial winter habitat	allowed within winter			known or potential
	allowed during the		within 2 miles of active		that are subject to	range for GRSG from			sage grouse habitat.
	following time		leks (strutting		seasonal protection	November I through			Prior to entry on any
	period(s). This stipulation does not		grounds). Minimize human activity within		from disturbance. Seasonal restrictions	March 31.			lease areas which include known or
	apply to operations		view (or by at least 0.6		from disturbance in	Objective: To protect			potential habitat, the
	and maintenance of		mile) of leks especially		GRSG crucial winter	GRSG from			lessee (operator) shall
	production facilities.		between midnight and		habitat apply during	disturbance during the			contact the
	Sage Grouse Winter		10:00AM.		the period November I to March 15. This	crucial winter period to maintain GRSG			appropriate BLM Field Office to discuss any
	Habitat:		April 15th-July 30th		stipulation does not	populations.			proposed activities.
	Sage grouse winter		Avoid nesting areas,		apply to operating				During the times
	habitat from February		the majority of which		facilities.	Exception: An			specified below, avoid
	15 to May 15. Purpose: Protection of		are within a two mile radius of lek sites in			exception to this			all development or
	GRSG winter habitat		big sage.			stipulation may be granted by the			exploration activities within known or
	and during periods of		00			authorized officer, in			potential nesting,
	stress for the birds,		June 1st- November			consultation with			brood-rearing and
	Tonopah RMP, p. 8		lst			Nevada Department			winter habitat, and

Table N-2
Draft LUPA/ EIS Alternative A Fluid Mineral Stipulations

District:	Tonopah	Battle Mountain	Mount Lewis	Carson City	Elko	Ely	Las Vegas	Tonopah	Winnemucca
	and Plan Maintenance		Avoid brood rearing	Gui son Giej		of Wildlife, if the		- Circ pui	within I km (0.6 mile)
	Sheet 3.		areas (especially			operator submits a			of known or potential
	Silect 3.		riparian areas where			plan that			habitat (PMUs). The
			broods concentrate			demonstrates that			times specified are per
			beginning usually in			impacts from the			interim NV Guidelines
			June) by 0.6 mile.			proposed action are			or as determined by
			Julie) by 0.6 fillie.			minimal or can be			Field Office and
			Dates will vary:			adequately mitigated.			Wildlife personnel.
			Avoid GRSG wintering			adequately miligated.			vviidille personnel.
			areas by 0.6 mile while			Modification: The			Nesting habitat and
						boundaries of the			
			occupied. Minimize disturbance						brood-rearing habitats:
			of vegetation in all			stipulated area may be modified if the			April through August Winter habitats:
			known GRSG habitats.			authorized officer, in			October through
						consultation with			_
			Do not allow dogs to run loose on project			Nevada Department			March
						•			
			sites. Disturbance of			of Wildlife, determines			
			nesting or brood			that portions of the			
			rearing GRSG by dogs			area no longer contain			
			may cause the GRSG to abandon nest or			GRSG winter habitat. The dates for the			
			young.			timing restriction may			
						be modified if new			
						information indicates			
						the dates are not valid			
						for the leasehold.			
						Waiver: The			
						stipulation may be			
						waived if the			
						authorized officer, in			
						consultation with			
						Nevada Department			
						of Wildlife determines			
						that the entire			
						leasehold no longer			
						contains winter range			
						for GRSG.			
			9	Stipulations for Great	ter Sage-Grouse Crucia	l Nesting			
Stipulation:	No Stipulation	Greater Sage Grouse	No Stipulation	No Stipulation	Stipulation: Timing	No Stipulation	No Stipulation	NV-WDO-WILD-02,	No Stipulation
		March 1st-May 15th			Limitation. No surface			TL (2002/2008)	
		Avoid mineral or			activity would be			Timing limitations on	
		energy related facilities			allowed within two			known or potential	
		within 2 miles of active			miles of a GRSG lek			GRSG habitat. Prior	
			1		from March I through	1		40 004001 00 0011 10000	i
		leks (strutting grounds). Minimize			May 15 (June 15).			to entry on any lease areas which include	

Table N-2
Draft LUPA/ EIS Alternative A Fluid Mineral Stipulations

District:	Tonopah	Battle Mountain	Mount Lewis	Carson City	Elko	Ely	Las Vegas	Tonopah	Winnemucca
41-41-154	- Tonio pani	human activity within				/		known or potential	-Villing Harden
		view (or by at least 0.6			Objective: To protect			habitat, the lessee	
		mile) of leks especially			GRSG nesting			(operator) shall	
		between midnight and			activities associated			contact the	
		10:00AM.			with leks to maintain			appropriate BLM Field	
					GRSG populations.			Office to discuss any	
		April 15th-July 30th						proposed activities.	
		Avoid nesting areas,			Exception: An			During the times	
		the majority of which			exception to this			specified below, avoid	
		are within a two mile			stipulation may be			all development or	
		radius of lek sites in			granted by the			exploration activities	
		big sage.			authorized officer, in			within known or	
					consultation with			potential nesting,	
		June 1st- November			Nevada Department			brood-rearing and	
		İst			of Wildlife, if the			winter habitat, and	
		Avoid brood rearing			operator submits a			within I km (0.6 mile)	
		areas (especially			plan that			of known or potential	
		riparian areas where			demonstrates that			habitat (PMUs). The	
		broods concentrate			impacts from the			times specified are per	
		beginning usually in			proposed action are			interim NV Guidelines	
		June) by 0.6 mile.			minimal or can be			or as determined by	
					adequately mitigated.			Field Office and	
		Dates will vary:						Wildlife personnel.	
		Avoid GRSG wintering			Modification: The				
		areas by 0.6 mile while			boundaries of the			Nesting habitat and	
		occupied.			stipulated area may be			brood-rearing habitats:	
		Minimize disturbance			modified if the			April through August	
		of vegetation in all			authorized officer, in			Winter habitats:	
		known GRSG habitats.			consultation with			October through	
		Do not allow dogs to			Nevada Department			March	
		run loose on project			of Wildlife, determines				
		sites. Disturbance of			that portions of the				
		nesting or brood			area can be occupied				
		rearing GRSG by dogs			without adversely				
		may cause the GRSG			affecting GRSG nesting				
		to abandon nest or			activity. The dates for				
		young.			the timing restriction				
					may be modified if				
					new information				
					indicates the dates are				
					not valid for the				
					leasehold.				
					Waiver: The				
					stipulation may be				
					waived if the				
					authorized officer, in				

Table N-2 Draft LUPA/ EIS Alternative A Fluid Mineral Stipulations

District:	Tonopah	Battle Mountain	Mount Lewis	Carson City	Elko	Ely	Las Vegas	Tonopah	Winnemucca
					consultation with				
					Nevada Department				
					of Wildlife determines				
					that the entire				
					leasehold no longer				
					contains nesting				1
					habitat for GRSG.				1